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Color PDUs Make It Easy To Locate, Identify Power Feeds

Desire To Help Customers Solve Problems Drives Idea Behind Newest Innovation From Server Technology

SOMETIMES, YOU CAN OVERCOME even the most difficult challenges with a relatively simple idea.

Such is the case with the new color PDU options from Server Technology, which provide a simple way for data center administrators to easily separate, locate, and identify the power distribution pathways coming into their data centers and individual racks.

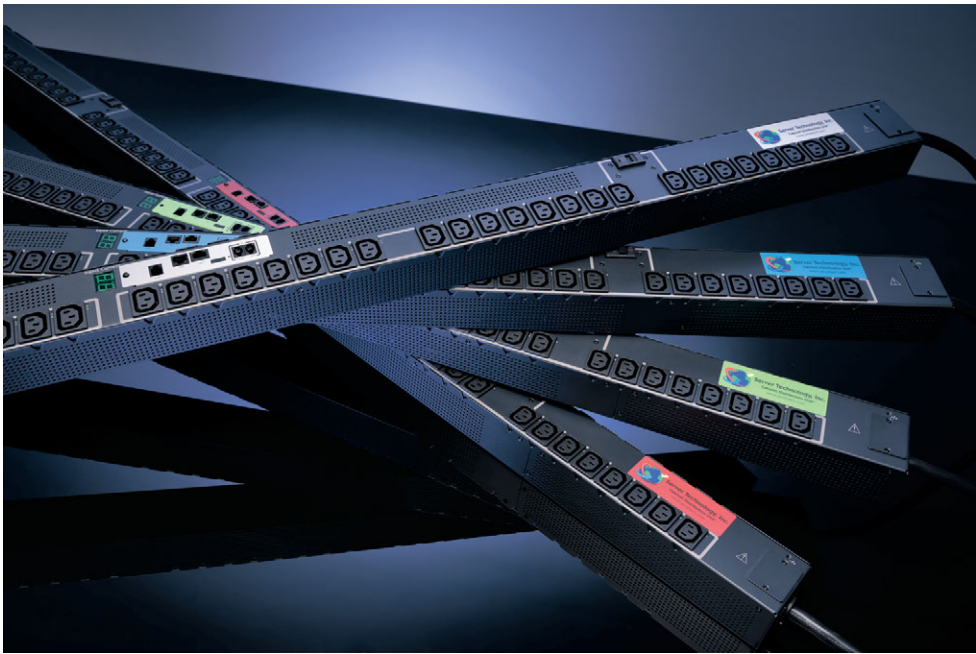
As with virtually all product innovation and development that comes from Server Technology, the idea behind providing color options for the company's PDUs came from customer requests.

"We tend to focus on customer needs, and this development is rooted in their requests," says Robert Faulkner, Server Technology product manager. The company puts its executive leadership team's more than 175 years of combined expertise to work fulfilling those customers' requests.

Differentiate Power Feeds

Over the years, Faulkner says, it has become more and more desirable to have an easy way to differentiate between multiple PDUs in a cabinet. "In most medium-sized to large data centers, there are multiple pathways for power distribution," Faulkner says.

As a simple example, he says, a data center would have two UPSes, with an A and B feed providing two separate sources of conditioned power for redundancy in cabinets. In a case such as this, he says, if one of the power sources goes down or you have to otherwise troubleshoot a power-related problem, you want to be able to



easily identify which power supply goes to which UPS.

The Server Technology color PDU options provide a way to make sure that it's easy to identify the separate power feeds going into servers and other gear that have multiple power supplies, Faulkner says.

A Splash Of Color

Server Technology PDUs now come with five color options: black, blue, green, red, and white. The color system includes three parts: the color that goes on the PDU itself in the logo/label and interface card; the PDU cord, which is earmarked with a color band around it; and an ancillary dot sticker that customers can put on other

equipment that is associated with the PDU so they can easily identify what equipment goes with what PDU.

Faulkner says the first instinct would be to color the entire PDU. But because Server Technology has the industry's largest catalog of rackmount power distribution SKUs and products, coloring the entire product lineup would be time-consuming and expensive.

By simply adding the color identification labels, Server Technology is able to "provide the real goal to the customer, which is identification," Faulkner says. Plus, Server Technology is able to offer the color options at no added cost to the customer and with the same turnaround time as standard PDU orders.

Additional Benefits

The color options provide more than just an easy way to separate and identify power feeds. "Lots of data center cabinets are black," Faulkner says, and with organizations reducing lighting to help save power, having color can help guide administrators when they're trying to add new equipment or troubleshoot an issue. "They can easily tell which one is the master, which one is A and B," he says.

The color PDUs have a non-technical benefit, as well. "Although a standard data center may indeed just be a data center, some enterprises have showcase data centers or individual rows," Faulkner says.


These showcase data centers or server rows are often used to demonstrate a data center's capabilities to customers or corporate higher-ups who could come from a non-technical background. Faulkner says having a system of color PDUs throughout the data center provides an easy way to demonstrate the data center's capabilities in a non-technical way.

Available On Entire Product Line

The new color options are available on any vertical or horizontal PDU from Server Technology. The product lineup includes basic, metered, smart, and switched PDUs.

The company's smart, or intelligent, PDU lineup is by far the most popular, Faulkner says. Smart PDUs come in dozens of different configurations, ranging from 110 to 400 volts, 20 to 60 amps, and 16 to 48 outlets. With the PDUs, you can view power, temperature, and humidity levels remotely through a Web browser or receive SNMP-based and email alerts if conditions exceed defined thresholds.

On smart PDUs with the new color option, the interface card faceplate is painted the black, blue, green, red, or white color, providing a quick connection for both network and power, Faulkner says. "That way, both sides of the enterprise can see where they're going."

Adding color is a "fairly simple concept for being able to solve a problem," Faulkner says. But any innovation that can improve organization, reduce the time spent troubleshooting, and help increase uptime is one worth investing in. 



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FEATURED PRODUCT

An Affordable Upgrade Path To 40Gb

The Modular, 64-Port Interface Masters Niagara 2842 Modular Bypass/Network Packet Broker Switch Proves Key

THE ROAD TO A 40Gb network can be paved with confusion, pitfalls, and the need to spend what might seem like endless amounts of cash. But as you’re transitioning to 40Gb, you can make investments to extend the life of your existing 1Gb or 10Gb equipment, allowing you to upgrade over time as prices drop and budgets allow.

The 2U Niagara 2842 system from Interface Masters is one such investment. It’s the industry’s first modular 16-segment intelligent active bypass switch and PacketMaster that can handle 1Gb, 10Gb, and 40Gb security and monitoring tools.

Preparing For 40Gb

Developing “industry firsts” has become standard fare for Interface Masters, which also counts the industry’s first high port density 40Gb PacketMaster system for network monitoring, 40G Aggregation TAP and the first 40Gb intelligent active bypass switch with 10Gb traffic monitor ports among its products.

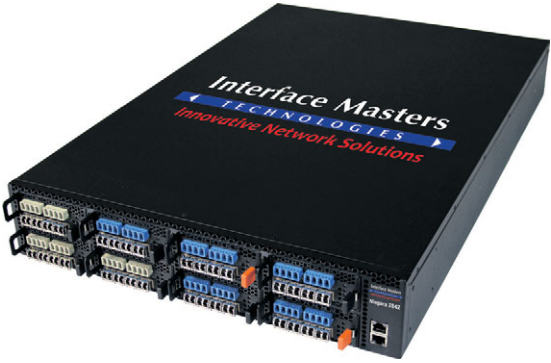
“We’re preparing ourselves for the market and want to have a proven 40Gb solution offering when the market is ready to start upgrading to higher speeds,” says Matthew Butrimovitz, marketing manager. “Interface Masters’ leadership in the Bypass Market, plus the industry-leading density separates this Network Packet Broker solution from the rest of the market.

Grow With You

It’s expensive to purchase 40Gb inline networking appliances such as IPS, IDS, WAN acceleration, DPI, and data loss prevention systems, which is where the Niagara 2842 comes in. The 2U rackmount system lets you continue to use your existing 1Gb or 10Gb appliances while ensuring network uptime, with modular segments that can handle 1Gb, 10Gb, or 40Gb.

Each of eight available hot-swappable module slots can support a pure PacketMaster load balancing module or a PacketMaster/bypass combination module. The PacketMaster only modules have eight SFP+ ports or four QSFP ports each, while the PacketMaster/bypass combination modules support dual 1G or 10G Active bypass segments or one 40G Active Bypass Segment (each segment supports two network ports with bypass and two inline appliance ports)

With Bypass configuration, the system can handle up to 16 10Gb or 1Gb segments or up to six 40Gb segments total, which leads the industry in terms of the number of 10G or



40Gb appliances supported per Rackmount unit.

Regardless of whether you have 1Gb, 10Gb, or 40Gb appliances, the Niagara 2842 can handle all three. As you upgrade your network, you can upgrade this Network Packet Broker with it. Plus, each segment is field-replaceable, reducing the lead time spent waiting for a system to come in, Butrimovitz says.

Ensure Uptime

The Niagara 2842’s upgradability and high port density serve as the foundation for ensuring your network uptime.

The 2842’s PacketMaster capabilities allow for granular and accurate session-based load-balancing of network traffic, mirroring of one to many or many to many ports, extensive filtering, packet slicing, and aggregation of many to one port.

The active bypass features ensure that network traffic keeps moving even if a monitoring tool fails. The system’s heartbeat

monitors the health of each monitoring tool based on the frequency and heartbeat packet you choose. In the event an inline appliances has a software crash, system failure, loss of power, or other malfunction, the Niagara 2842 diverts traffic around the down appliance so you can troubleshoot the problem.

The 2842’s 1.2Tbps backplane allows extensive processing of asymmetric traffic and session-based distribution to appliance ports without network interruption.

“The Niagara 2842 is an unmatched all-in-one system that stands alone in the market in terms of price performance, flexibility, feature set and network visibility and uptime,” Butrimovitz says.

Interface Masters Niagara 2842

(408) 441-9341 ext. 147
www.interfacemasters.com

A 16-segment modular bypass switch with PacketMaster load balancing capabilities. Modular segments ensure you can upgrade from 1Gb to 10Gb and 40Gb as time and budgets allow.

Interface Masters
TECHNOLOGIES
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FEATURED PRODUCT

Maintain The Ideal Temperature

Geist Opengate Containment System Uses Sensors, Chimneys & Enclosures To Provide An Intelligent Cooling Solution For Your Data Center

HOW DO YOU SOLVE cooling problems in your data center? Do you invest in portable cooling? Propose having a contractor install additional CRAC units? Rearrange equipment in an attempt to get by?

“Traditionally, cooling problems get addressed with more CRAC units as a band-aid fix, which results in a situation where the data center is vastly over-cooled,” says Bryce Kleen, product manager at Geist. “It’s like adding a window air-conditioning unit to your new house to keep the temperature cool because it gets hot when you leave all of your doors and windows open.” This is very expensive, and you can end up wasting precious money and resources.

An intelligent containment solution, such as the Geist Opengate containment system, is the best option to manage data center cooling and airflow without overcooling.

Maximize Performance

Opengate by Geist is designed to maximize the performance of your cooling system by delivering the hottest return air to the CRAC while only requiring a modest level of cold air at the start, Kleen says.

It does so by providing “intelligent containment,” he says. This two-step process



focuses on containing heat in the back of the cabinet and then exhausting it through a chimney directly to a CRAC unit, ensuring data center equipment stays at the ideal temperature. In fact, IT intake air is stabilized within a few degrees of the supply air temperature at all points in the data center.

The Opengate system includes expertly manufactured chimneys and conversion kits that seal cabinets at the rear and sides and work to channel hot air directly to the hot air return and minimize hot air mixing.

But unlike simple passive chimney systems, Geist’s Opengate incorporates smart fans to regulate the internal pressure of the cabinet, Kleen says. The fans speed

up or slow down based on the information they receive from pressure and temperature sensors both inside and outside the cabinet.

“It’s a process that successfully quarantines all IT exhaust, so data centers can optimize their cooling supply air temperature,” he says. “In fact, by containing the hot air and keeping it from mixing with the cold air, data centers can save up to 40% on cooling energy.”

Works With Your Existing Setup

Opengate can work with virtually any type of cabinet setup, whether it’s a single cabinet or row of cabinets, cabinets that are partially full or ones that have very high densities.

With Geist’s vast library of cabinet-specific installation kits, including cabinet tops, door-blocking kits, and mounting hardware, Opengate is available for virtually every new or existing cabinet model or configuration. And Geist design engineers can deliver a custom solution, if needed, ensuring Opengate can be retrofitted to work in any existing data center, Kleen

says, regardless of size or the cold air process currently in use.

The Opengate system’s capacity automatically scales as loads are added or removed. High-density loads can be combined, and multiple systems can work together to share cabinet loads. If there’s a power failure, the Geist cooling unit can continue to operate using power provided by its PDU.

The software included with Opengate automatically monitors and reports environmental conditions, and you can receive automatic email or SNMP notifications of system threshold breaches. The Opengate system provides a real-time airflow consumption measurement at the rack level. Coupled with Geist’s Environet DCIM solution, data centers now have a means to accurately sequence CRAC units or scale back cooling horsepower to match the ever-changing heat loads of today’s dynamic data centers.

Opengate by Geist

(800) 432-3219
www.geistglobal.com

An active containment system that focuses on containing heat and expelling heat directly to CRAC units, maintaining the ideal temperature for your data center, regardless of its size or density.

FEATURED PRODUCT

Document Filters & Enterprise Search

Most People Understand The Concept Of Enterprise Search; Less Understood Are The Document Filters That Underlie Enterprise Search (Including Hit Highlighting, Etc.)

If You Looked at a Microsoft Word file in binary format (as a search engine needs to review it), the file structure is so complex as to make it nearly impossible to pick out the text of the document. In fact, MS Word documents include not only body text but also fields, and often even “hidden” meta data. And MS Word documents can have a nested structure, embedding multiple layers of other documents within an MS Word file.

Delving through these levels of complexity requires a programmatic implementation embedding a deep understanding of file structure. That is the job of the document filters.

But document filters are not just a static item; rather, they are a dynamic component. Every update, for example, that Microsoft makes to the MS Word format requires a corresponding adjustment to the document filters. And any adjustment to account for file format updates must preserve backward compatibility with existing MS Word files.

One leading supplier of enterprise and developer text search software, dtSearch Corp., has built its own document filters over the span of more than two decades. And the company still has to continually

upgrade its document filters to correspond with the release of new data formats.

Document Filters: Not Just For Documents

In addition to MS Word, document filters must support many other data formats as well. All of these formats typically include body text and meta data embedded in a unique binary file structure that is itself subject to evolution.

Continuing with the example of dtSearch, along with MS Word, other MS Office supported file types include: PowerPoint, Excel, Access and OneNote. Additionally, the document filters support PDF, RTF, OpenOffice, HTML, XML, CSV and many other file types, along with compression formats like RAR, ZIP and GZIP/TAR.


Because so much data is now in emails, the dtSearch document filters also support popular email types from MS Outlook, Exchange and Thunderbird, etc. And support extends not only to the email body and meta data, but also to attachments, including nested attachment.

The dtSearch document filters cover not only the text and fields of individual files and emails, but also recursively embedded versions of these files and emails. For

example, the dtSearch document filters would support an email with a ZIP attachment that contains an MS Access file with an embedded PowerPoint.

The document filters also support browser-compatible images in nearly all above-mentioned formats. Adding to the example above, the dtSearch document filters would not only support an email with a ZIP attachment that contains an MS Access document with a nested PowerPoint, but also an image inside the nested PowerPoint.

The dtSearch Engine APIs can also work with database data like SQL-type data. While SQL itself is not technically a file format, it can include BLOB data consisting of embedded documents inside the SQL data. The same integrated support requirements for recursively embedded documents, meta data, images and the like apply to this BLOB data.

A Spider built into the dtSearch product line also supports dynamic web data (SharePoint, PHP, ASP.NET, SharePoint, etc.) as well as static web data. And of course, this data can also consist of or embed document data like HTML, PDF, XSL/XML, or even classic Office files, all off which require the document filters. 



- Desktop with Spider
- Network with Spider
- Publish (portable media)
- Web with Spider *includes 64-bit versions*
- Engine for Linux
- Engine for Win & .NET
- Document Filters also available for separate licensing
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CPS, LLC U-X3 Universal AC Power Switch



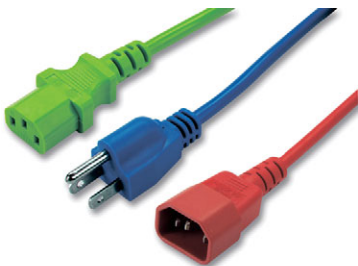
Computer Peripheral Solutions, LLC manufactures numerous products that are targeted towards very economical problem resolutions and increasing efficiencies within various niches in today's networking, such as local and remote controlled power devices, remote switching, telephone line sharing and dial security. They can be used in a variety of applications such as kiosks, monitoring equipment, security systems, observatories and lab/test centers, to name a few. Most units offer several different types of control, for example: USB, Wireless, ring count, touch-tone, cell and web. The products range from a single box to the more flexible and scalable modular systems.

The U-X3 (pictured above) is an economical, but extremely flexible AC power control device that can be used to control the AC power to three different devices via Ethernet, USB or Wireless.

The products were developed as a result of specific user requirements, others as OEM products while still others evolved solely on speculation. This has resulted in a rather diverse product line and has also served to expand the company's technology base.

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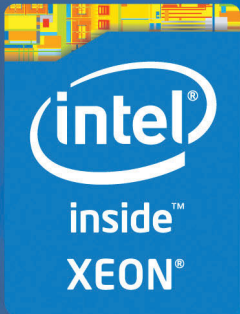
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- Reliable PCB Power Distribution
- Fail Functional Design



Metered Outlet - MRP

Additional Unique Features



All Circuit Breakers Monitored

Most metered power solutions only monitor input power. BayTech monitors all circuit breakers and reports via SNMP when thresholds are met.



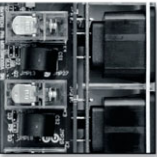
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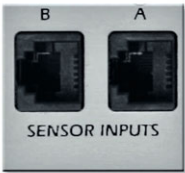
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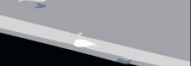




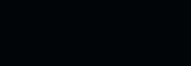
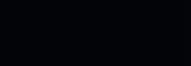
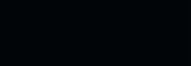




















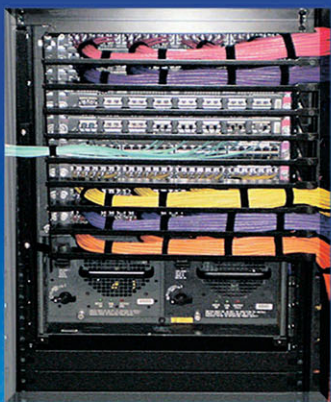
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POWER IS STILL KING when it comes to the top concerns data center managers have as they work to keep their data centers, the equipment inside them, and their enterprises as a whole up and running.

Calvin Nicholson, senior director of software and firmware at Server Technology, says there are other concerns, including increased cabinet densities, demand for more computing power, and the need to locate stranded capacity. But many of those concerns all center around being more efficient in the way a data center uses its power.

“Power costs are going up, and availability is going down,” he says. Overcoming those conflicting issues requires a way to better manage and control the power your data center uses.

Use Power More Efficiently

Server Technology’s Sentry Power Manager (SPM) helps ensure you’re using power in the most efficient way possible. SPM’s capacity planning and predictive features help you spot stranded capacity and help you know if and when you might run out of power.

“If you’re not monitoring power, how do you know how much you’re using compared

to availability,” he says. “If you have available capacity, you can put off a decision that could cost you thousands of dollars for colo space or up to millions of dollars for a new data center build.”

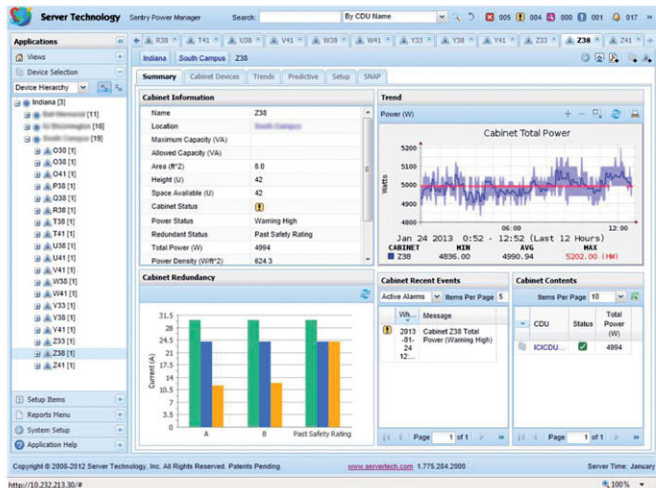
Sentry Power Manager provides a way to measure, monitor, and trend data center power information in one central location. The product comes in both a standalone appliance and virtual version.

Easy To Set Up & Configure

With SPM’s SNAP feature, you put in an IP range and SPM discovers the installed CDUs—regardless of manufacturer or whether it’s just a few or thousands—and brings the information back into the SPM interface.

You can configure cabinets and locations and get a global view of your data center floor and CDUs or quickly drill down to an individual cabinet or CDU. You can group and cluster outlets together across IP addresses, rows of cabinets, or the whole data center.

Use the dashboard to configure email alerts, SNMP trap forwarding, and alarms based on the power and environmental thresholds you set. Plus you’ll have a central location for managing alarms.



Make Informed Decisions

Using the dashboard, you can configure your own NOC view, Nicholson says, picking views, alerts, and alarms to see on the main screen. Different users can configure different NOC views.

Such capabilities give you a way to balance three-phase lines and map and manage your power systems. In addition, you can also see your PUE value, total power usage, whether a cabinet is configured for power redundancy, what cabinets are running too hot, and which cabinets might be overloaded.

With SPM’s scheduling features, you can automatically generate system reports and have them sent via email to a list of

recipients. You can even schedule certain devices to turn on or off as demand fluctuates, opening up the possibility for radical power savings, Nicholson says.

“Whether it’s looking at servers that aren’t doing any work and taking them offline, looking at the overall cabinet and whether you have the ability to turn things off, or if you’re trying to provision a new device and decide what cabinets have available power,” he says, SPM can provide the data you need.



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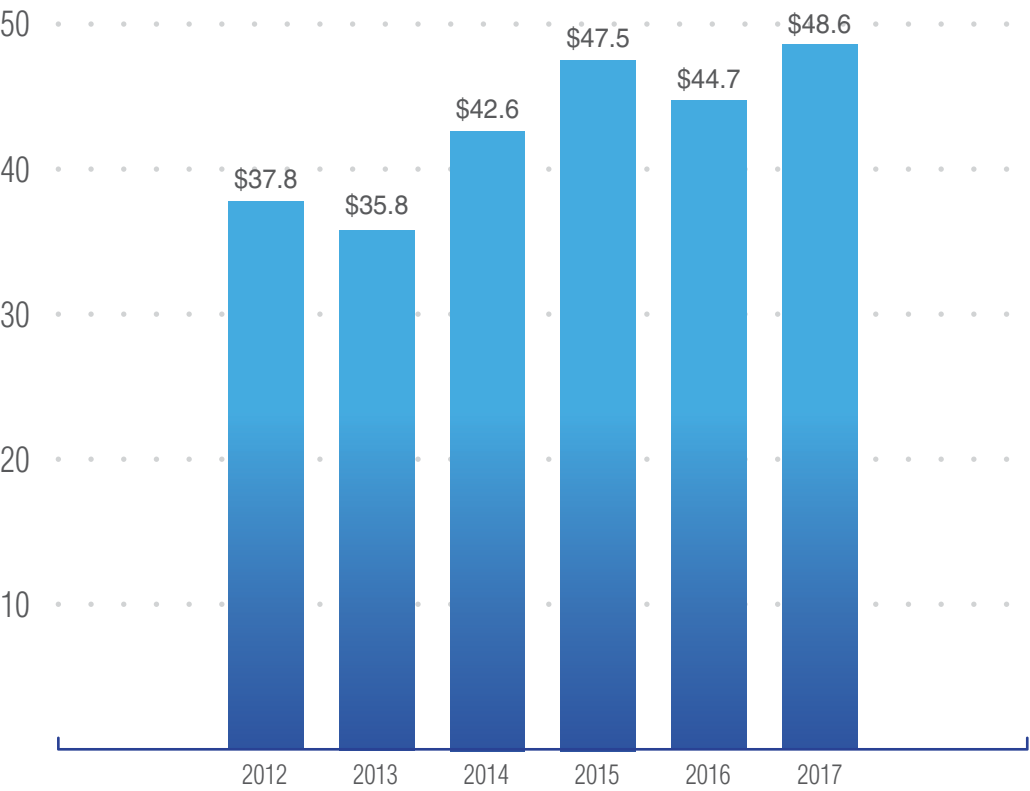
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■ Current Semiconductor Slump Won't Last, Gartner Says

Research firm Gartner projects that total worldwide semiconductor manufacturing equipment spending will decline 5.5% this year relative to 2012, totaling \$35.8 billion this year compared to \$37.8 billion last year. “Looking beyond 2013, we expect that the current economic malaise will have worked its way through the industry and spending will follow a generally increasing pattern in all sectors throughout the rest of the forecast period,” says Bob Johnson, research vice president for Gartner. This chart shows this year’s dip and how Gartner expects the coming years to look.

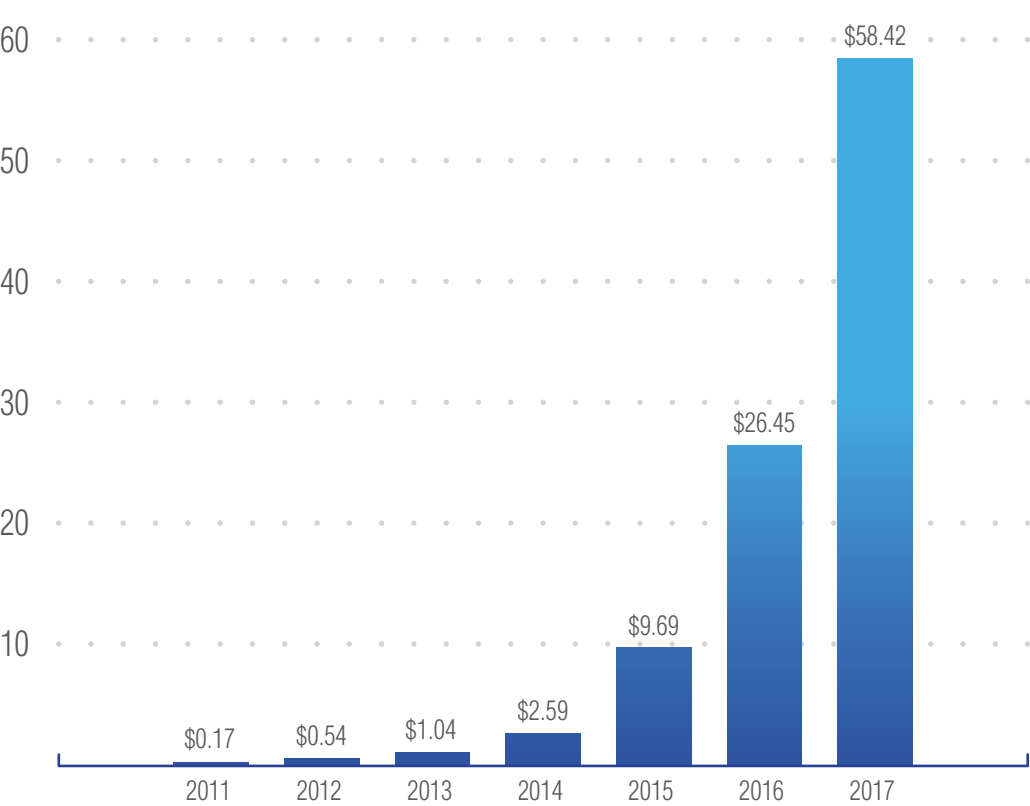
Semiconductor Capital Equipment Spending (In Billions of Dollars):



■ Mobile Payment Market Slow But Growing

The practice of making mobile point of sale payments—that is, buying something by swiping or bumping a payment-capable smartphone against an in-store payment device or kiosk—hasn’t taken off as quickly as some analysts anticipated, but it is taking off. According to eMarketer, the dollar value of all mobile payments in the United States more than tripled between 2011 and 2012 but only doubled between 2012 and 2013. The marketing research firm expects continued increase in usage, thanks in large part to broader availability of the secure short-range wireless technology Near Field Communications (NFC) in smartphones, to boost those numbers substantially in the coming years. This chart illustrates the growth that eMarketer anticipates:

Anticipated Growth of Mobile Payments (in Billions of Dollars):



■ Enterprises Adjusting To More Sophisticated Malware

Enterprises are adding increased levels of end-point security as they work to combat malware. Over the past 24 months, according to a recent survey by Enterprise Strategy Group, organizations have seen an increase in sophisticated and targeted malware attacks. More than 60% of respondents say their existing endpoint security software isn’t up to the task of detecting zero-day and polymorphic malware. The majority of attacks continue to be caused by users not knowing cybersecurity risks, Enterprise Strategy Group found. Employees opening an infected email attachment or clicking an infected URL in an email or while on the Internet were noted as the leading sources of malware infections.

■ Reports Contrast Over Rising Mobile Phone Sales

IDC and Strategy Analytics offer contrasting totals of second-quarter worldwide mobile phone sales, but both research firms agree that the numbers are rising. IDC reports that the mobile phone market grew 6% year-over-year, from 407.7 million in Q2 2012 to 432.1 million in the second quarter of this year. Strategy Analytics put the growth rate at a more modest 4%, reporting a 386 million total for this year compared to 371.5 million for the year-ago quarter. “This was the mobile phone industry’s fastest growth rate since the second quarter of 2012,” says Neil Shah, senior analyst with Strategy Analytics. On a global scale, IDC reports that 237.9 million smartphone shipped in the second quarter of this year, up 52.3% from the 156.2 million shipped in Q2 2012. “Market opportunities exist at all levels, including the high end,” says Ramon Llamas, research manager with IDC. “We fully expect to see large-screen smartphones and other flagship devices establish a presence within the lower-priced smartphone segment as well.”

■ Strong Memory Growth, Higher Selling Prices Drive Market Up

Worldwide revenue in the semiconductor market will be up 6.9% this year, according to IDC’s mid-year update, reaching \$320 billion. PC demand continues to be weak, IDC notes, but strong memory growth, particularly for mobile phones and tablets, and higher average selling prices for DRAM and NAND are driving the overall market growth. IDC reports that semiconductor inventories decreased during the first half of this year but are now in balance with demand so growth can resume during the coming months. IDC notes several economic issues weighing on the semiconductor market, including the slowdown in China, Eurozone debt crisis, Japan recession, and the United States’ sequestration.

Government IT Budgets Stabilizing

About 75% of government IT budgets will stay the same or increase this year, according to research firm Gartner. “After years of being told to ‘do more with less,’ many government CIOs report that budgets have stabilized or are increasing, placing them in a better position to deliver and manage IT services more effectively and efficiently,” says Gartner research director Rick Howard. But that good news may be short-lived, as Gartner expects government and education IT budgets to have a relatively modest CAGR of 1.3% through 2017. The government and education sectors will increase spending on IT services, software, and data centers, Gartner reports, while reducing spending on internal technology services, devices, and telecom services.



Gartner: Cloud Contracts Need More Transparency

Most IT procurement professionals are and will continue to be dissatisfied with SaaS contract language and protections related to security. The prediction, made by Gartner, comes because “SaaS contracts often have ambiguous terms regarding the maintenance of data confidentiality, data integrity, and recovery after a data loss incident.” Companies comparing cloud service providers need to ensure contracts allow for annual security audits and certifications, Gartner reports. In addition, don’t assume that contracts include adequate service levels for security and recovery and make sure to negotiate your contract to include 24 to 36 months of fee liability limits and additional liability insurances.

Wireless LAN Market Rapidly Growing

In a new report on the wireless market, Dell’Oro Group forecasts that overall revenues for the wireless LAN technology market will near \$12 billion in 2017, which represents 57% growth over 2012 revenues. “Enterprises now see wireless LAN access as critical, yet historically have installed wireless as an overlay network that is

separate from the Ethernet network,” says Chris DePuy, vice president with Dell’Oro Group. Wireless LAN growth will be driven mainly by service provider Wi-Fi purchases, upgrades to the new 802.11ac Wi-Fi standard, and cloud-based wireless network management implementations, according to Dell’Oro Group.

Gartner Sees Emerging Markets As Key To Supply Chain Planning

A new report from Gartner on supply chain strategies asserts that “explosive growth” in emerging markets will make those markets a leading area for business growth in the decades to come. “Businesses are positioning to take advantage of the most explosive growth opportunity since the industrial revolution,” says Mike Burnett, research vice president with Gartner. He adds that of the 390-plus CEOs surveyed for the Gartner report, many “indicated concern about a continued recession in advanced economies. As business executives look to emerging markets for opportunity, the supply chain organization will be tasked with serving that growth.” What do CEOs think? According to the survey, there was an almost 50-50 split between those who see global supply chains as “complex and brittle” vs. highly resilient. In either case, Gartner stresses the value for companies of developing the ability to scale for global demand while paying attention to customer needs in both developed and emerging economies.

Forrester Report Covers Employee File Sharing

Web-based file synchronization, sharing, and storage tools have become “must-have” capabilities in modern business given the rise of consumerization (employees using consumer-oriented mobile devices as means for getting work done), according to Forrester Research. In its new report, “The Forrester Wave: File Sync And Share Platforms, Q3 2013,” the research firm points out that 21% of global information workers use file sync solutions right now. What’s more, 34% of those surveyed for the report say some of their team members work in different buildings, a separate time zone, or another country. One



upshot of the report’s many findings is that information workers need file sync services not just for storing files, but to actively collaborate with colleagues; regardless of whether companies put management controls in place, it’s in their best interests to recognize this present reality and work to support it.



Report Sheds Light On Costs Of Cybercrime

Losses from cybercrime may be costing the United States economy about \$100 billion a year, which equates to more than 500,000 jobs. Those estimates come from a recent report issued by the Center for Strategic and International Studies, which admits that coming up with the estimates was difficult considering a range of existing estimates and imprecise survey results because companies often conceal their losses or are not always aware of what has been taken. Worldwide, the costs of cybercrime and cyber espionage could add up to as much as \$400 billion. In its study, the center notes that, while those figures may sound staggering, they need to be viewed in perspective. With a global GDP of \$70 trillion in 2011, a \$400 billion loss is just a fraction of a percent of global income.

IT Outsourcing Continues To Rise

The information technology outsourcing market will reach \$288 billion this year, a 2.8% increase over 2012, if Gartner’s current forecast holds true. This represents a greater increase than the research firm had previously forecast, mainly due to increases in the outsourcing of custom application creation and infrastructure utility services. “Enterprise buyers pursuing hybrid IT strategies and small and midsize business buyers adopting infrastructure as a service are key drivers in cloud and data center service segment growth rates,” says Bryan Britz, research vice president with Gartner. Data outsourcing is in a gradual decline, according to Gartner, while outsourcing support for mobile devices such as smartphones and tablets is on the rise as the BYOD trend continues.

SIX QUICK TIPS

Plan For & Perform A Server Refresh

New Servers Can Be More Efficient & Effective, But Only If You Know When & How To Upgrade

DATA CENTER SERVERS require significant attention. A drop in performance creates a domino effect that can be felt by anyone within the company and even by customers outside of the organization.

For every data center, there comes a time when new demands are placed on a server or the cost of maintaining a server outweighs its usefulness. Being able to recognize the signs of such occurrences, however, isn't always easy. Here are a few money-saving and performance-enhancing tips for going through a server refresh.

✓ *Look At Upgrading Components First*

You may assume that a server refresh requires an overhaul, but it's possible to

simply swap out individual components to give your servers that extra boost.

"Provided a customer sticks with industry-standard chassis and rack solutions, swapping out components or systems for higher-efficiency models are the most cost-effective paths to hardware upgrades," says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). "Depending on supplier and processor road maps, a refresh can start at the component level upgrading HDDs to SSDs or installing faster memory and higher bandwidth interconnectivity options." You could also upgrade your CPU, the BIOS on a motherboard, or other components, he says.

It's possible to keep your existing racks and overall infrastructure setup without

completely starting from scratch. And you can refresh over time rather than all at once, letting you spread out the costs associated with server upgrades.

But if you don't already have standardized racks or enclosures for mounting multiple equipment modules, then a server refresh is a great time to make that change. "Look for server solutions with designs incorporating sliding rails and tool-less chassis access for easy maintenance and access to hot-swap hard drives, power supplies, fans, and other components that may need replacing," Clegg says.

✓ *Make Sense Of Cycles*

"I've been in hundreds of data centers in my life, and I can tell you that they try to

keep servers running as long as they can," says Dick Csaplar, senior research analyst at Aberdeen Research Group. "Once you have an application up and running and it's running fine and users are happy, you have so many other challenges in your life that going back and, say, migrating that application to a newer server, you're just not going to do it."

Typically, three years is the expected life span for servers—something you can tell, Csaplar says, because "most servers are sold with a three-year warranty." Although companies can buy warranties extending into years four and five, he says, "the warranty price skyrockets" because vendors have to keep older drives, CPUs, memory boards, and other parts on hand.



“It’s not that [servers] aren’t going to function; it’s the cost of the warranty and keeping them under warranty, and you absolutely want to do that, particularly as you go out in time,” Csaplar says. “The second thing is that the rate of modernization in servers today is just amazing.” Getting everything possible out of a server investment is appealing, but doing so can eventually cost more in the warranty while “giving up a lot of compute power by not refreshing to the newest technologies,” Csaplar says.

✓ *An Opportunity For New Technology*

Buying new energy-efficient servers gives you the option of upgrading the base features of your server. You can invest in

not only the features you’ll need now, but the features you’ll need as your company continues to grow.

Two such features, which often go hand and hand, are consolidation and virtualization. You may be able to replace two or three older servers with a single new unit, which can free up additional space for other pieces of equipment or increase the overall airflow of your data center. And you can implement server virtualization, which can lower your costs for individual computing platforms for employees.

“Virtualization has become a mainstream practice, and it can be used to assist consolidation by allowing multiple application workloads to share the same physical servers,” says Jenna Maertz,

consulting analyst at Info-Tech Research Group. “A combination of server consolidation and virtualization can save between 40 and 75% of upfront and ongoing hardware costs, making a server refresh significantly more affordable.”

✓ *Plan For Maximum Uptime*

Servers, Csaplar says, are designed to have about 99.5% uptime, which translates to just a few hours of unintended downtime per year. And those hours typically occur later in the server’s life.

A condition tied to downtime is how application usage has changed. “It used to be there was one app on one server,” Csaplar says. “You needed a new app, you bought a new server, and the server was being utilized 20

to 30%.” With virtualization, however, three to 10 or more applications might be on a single server. “So the impact of downtime when that server goes down—and it will—is going to affect far more applications than it would have before,” he says.

Remembering that not all servers are equal, and not all servers are supporting mission-critical applications, can be beneficial. To this end, Csaplar says companies can easily create a process in which they move critical applications to their newest servers and use older servers to support applications that are less important. Csaplar says virtualization can enable such possibilities as configuring settings so that if one server goes down, the application will automatically reboot on another server. P

✓ *Map Out Your Goals*

Mapping out short- and long-terms goals and strategies is vital to a successful server upgrade. Mark Bowker, Enterprise Strategy Group senior analyst, says that because server upgrades often align with new IT projects, applications, or application upgrades, it’s important that “IT focus on both the life cycle of the application and how it aligns with the expected life of the server and account for planned and unplanned scale.”

IT should also know its options. Too often, Bowker says, IT purchases a server with more capacity than needed, which provides the comfort of extra headroom but adds expense. “IT should understand what the latest processor chipset is on the market and what the stated road map of the chip manufacturers are,” he says. “This will help avoid buying into servers that are at the end of a product life cycle.”

✓ *Become More Energy-Efficient*

Implementing a server refresh provides a great opportunity to be more efficient environmentally and in terms of energy consumption. Older servers will often draw more power than newer, more efficient alternatives, so it may be more cost-effective to buy brand new servers as opposed to trying to maintain your existing ones. Improved energy efficiency can also lead to savings elsewhere. It will reduce the need for constant maintenance and repair, which can free up your IT team’s time for other projects. And it can also make your other systems more efficient.

“Energy consumption for data center cooling is rising,” says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). “The only way to curb this runaway cost and be more environmentally friendly is to transition to energy-efficient servers that operate at higher ambient temperatures and reduce dependency on air conditioning.”

BONUS TIPS:

✓ *Communicate With Your Server Vendor*

As part of a refresh, keep in constant contact with your vendor to ensure you are getting the features you need and to request additional services that may be free. “Ask vendors to help with capacity planning,” says Jenna Maertz, consulting analyst at Info-Tech Research Group. “Many vendors will try to win your business by offering free workload modeling services and tools, which can help you determine the capacity requirements for both your virtual and non-virtual workloads. This can help ensure that you get the maximum capacity out of each of your servers.”

✓ *Do More With Less*

“There is no such thing as an information recession, [so] organizations need to boost their return on innovation (the new ROI) by doing more with what they have,” says Greg Schulz, senior advisor at Server and StorageIO Group. This can include leveraging faster, denser servers that can do more work per watt, enable room to grow, and remove cost while boosting productivity.

Improve Your Data Center Environmental Monitoring

Choose The Right System, Then Get The Most Out Of It

ENVIRONMENTAL MONITORING is essential to data centers. Monitoring important factors such as the temperature and humidity helps you avoid costly downtime and equipment damage, and being able to have a complete picture of your data center environment helps ensure you're providing sufficient cooling, addressing potential hot spots, improving the overall efficiency of your data center, and reacting quickly when something isn't right. These tips and advice will help you take advantage of the many benefits environmental monitoring can provide.

✓ *Know Your Goals*

If you're looking to buy an environmental monitoring system for the first time or you want to upgrade to a different solution,

you should first know what exactly you want it to do.

"You need to identify your goals and your vulnerabilities," says Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com). "Is your goal to just make sure everything is running and just receive notifications when things fail, or are you looking to analyze the efficiency of the environment and make improvements? In other words, are you looking for alarm notification, or are you looking for data logging and trending?"

Also look at the type of conditions you want to monitor. For instance, you can track temperature, power consumption, or even airflow in addition to other elements. Know what conditions your data center

is prone to and invest in sensors that will either track those conditions for efficiency purposes, notify you if they reach a certain threshold, or both.

"Know thy facility," says Michael Sigourney, president and CEO of AVTECH Software (888/220-6700; www.avtech.com). "The first thing an IT or facilities manager needs to consider and create is an understanding of the basic layout and elements, both structure and equipment, within their facility," he says. "Knowing where threats are likely to occur or have occurred in the past is key to planning success. Environmental monitoring is not a 'one size fits all' scenario, as each facility is unique."

Harry Schechter, founder and CEO of Temperature@lert (866/524-3540; [\[.temperaturealert.com\]\(http://temperaturealert.com\), says, "Any solution you choose at a minimum should provide unalterable logging, data visualization for trend spotting, and of course alarm notification to multiple people when there is trouble."

Be sure to look at your company as a whole, Douglass says, to determine the overall need for environmental monitoring. "In many situations, there are similar monitoring needs at the same facility, on the same campus, or somewhere else within the same company," he says.

✓ *Don't Forget Humidity & Water*

You can sometimes get so focused on temperature that you neglect other conditions that can cause major issues. One such condition is high or low humidity.](http://www</p></div><div data-bbox=)



When combined with unstable temperature conditions, humidity can wreak havoc on your equipment. Some issues related to temperature and humidity can build slowly over time, so an environmental monitoring system that tracks both conditions will help you make necessary adjustments.

Water and leak detection can also be easy to neglect. Chris Pullen, president of RLE Technologies (800/518-1519; www.rletech.com), says that, while power failure is the No. 1 cause of downtime, water is the second and can often be the overall cause of a power failure. He says you need to install leak detection throughout your facility. “Don’t forget to look above the ceiling. What’s on the floors above your data center? Look outside the box.”

✓ *Check Your Alarms & Alerts*

Many environmental monitoring solutions feature notifications and alerts, typically either as audio or visual alarms or email- or SMS-based alerts. Although these alerts are helpful for monitoring your environment, they won’t do much unless the right person responds.

“The real challenge will be in setting the alarm thresholds—too wide a range and you won’t be alerted in time; too narrow a range and you’ll receive so many false alarms that future alarms will be ignored,” Schechter says. “It’s important to baseline any new system. In other words, watch those readings for a few hours so you can see the natural indoor

weather pattern of the room and set the alarm parameters accordingly.”


✓ *Invest In Management*

Once you’ve put an environmental monitoring system in place, it can be easy to get overwhelmed by all the data available.

Jon Fogelson, key accounts sales manager at RLE Technologies, says you need to purchase a monitoring system that can communicate with all your sensors and equipment. Then you can easily access an overview of equipment and sensors from one location, no matter where you are.

Even with a good management system, you can struggle with the issue of convergence, says Cam Rogers, vice president of domestic and international sales at RLE Technologies.

For example, he says, you may have a management system that requires a certain protocol but equipment that outputs another type of signal. “Even when they are able to convert available protocols to what they require for integration, then the issue becomes identifying what information is of value as some equipment provides more information than what could ever be needed or of use, leaving the data center manager overwhelmed with unnecessary information,” he says.

Ted Fletcher, RLE Technologies technical support manager, agrees, adding you need a simple view to monitor data. “Some systems spend more resources/time on graphics vs. monitoring the points. The faster the system can react, the faster a correction can be deployed.” 

✓ *Consider Redundancy*

“There are many possible causes of an environmental problem in a data center, like equipment failure, a nearby lightning strike, or even a car hitting a telephone pole,” says Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com).

“Anything can happen, and in many cases, more than one system may fail during the crisis. Always consider as much redundancy as possible. Avoid relying solely on your network to deliver alarm messages, as the network itself may be down. Consider products with more than one communication path or some method of out-of-band communications, such as phones lines or cellular.”

✓ *Avoid Excessive Dependencies*

Along with choosing a system with some form of redundancy built-in, you should try to avoid system dependencies with your environmental monitoring solutions. Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com), says that some systems require a server or PC to operate, “which can leave your system worthless if that server or PC has a problem.”

In the same way that your monitoring system should have multiple communications paths, it should also have a backup plan in case of power failures or other electrical issues. “Look for systems that use their own wireless technology that will keep operating during a power failure and independently of the Wi-Fi network,” Douglass says. “Relying on AC power is also a dependency, so built-in battery backup is never a bad thing with monitoring products.”

BONUS TIPS:

✓ *Regularly Test Sensors*

Just like you regularly check that your backups are running properly, your software patches are applied, and or your antivirus is up to date, run a quick test on your environmental monitoring systems to make sure alerts are getting through to the right people, says Harry Schechter, founder and CEO of Temperature@lert (866/524-3540; www.temperaturealert.com).

✓ *Look For These Overall Features*

- Ted Fletcher, technical support manager at RLE Technologies (800/518-1519; www.rletech.com), offers this list of features to look for in an environmental monitoring product:
- Easy access to view data.
 - Easy to set up and maintain.
 - No hidden fees.
 - Ability to connect to multiple pieces and brands of equipment (vendor-neutral).
 - Ability to work with open protocols (SNMP, Modbus, BACnet).
 - Reliable platform (solid-state hardware vs. servers using OS and mechanical components).
 - Email notification and ability to integrate to other BMS, BAS, and NMS systems for redundant paths if necessary.

SIX QUICK TIPS

Clean & Maintain The Data Center

Advice For What Needs To Be Done & When To Do It

HOW IMPORTANT is it to thoroughly clean and maintain your data center on a regular basis? For the answer, simply look at the importance of the data center itself and how much it would cost you as a company should any of the equipment inside your data center go down. Not only that, but having an unclean data center can negatively impact the performance of your equipment, causing it to malfunction or shortening its lifespan.

Avoiding performance degradation is the key to running a long-lasting data center and successful company, but it can be difficult to know where to get started and how to proceed. We'll show you what parts of your data center should be cleaned and maintained, how often, which cleaning tasks can be performed in-house, and when

it's time to invest in the expertise of a professional cleaning service.

✓ *Understand What Needs To Be Cleaned*

Always keep in mind that data center cleaning does much more than keep your physical infrastructure free of dust and debris. It also reflects positively or negatively on your company from both your employees' and customers' points of view.

When beginning the process of cleaning your data center, you should start by looking at every surface, space, and piece of equipment that will need to be cleaned. It's a safe bet that everything inside your data center will need to be cleaned at some point, including racks, shelves, power

equipment, light fixtures, flooring, and the under-floor area.

In essence, a solid data center cleaning should leave no stone unturned. It's a good idea to set up a solid cleaning schedule to ensure that your room is clean and equipment will be able to perform at the highest level. For example, depending on traffic in the data center, you'll likely want to clean the flooring at least monthly. The under-floor area and some equipment, such as UPSes, may only need to be cleaned once a year.

✓ *Develop A Maintenance Plan*

Having a well-thought-out maintenance plan on hand can prevent and alleviate a fair amount of stress, disorganization,

and financial loss related to infrastructure failures. Have a detailed work procedure covering what needs to be cleaned, when, how often, who will be impacted, and what to do if an emergency should happen.

Clive Longbottom, service director for business process facilitation at analyst firm Quocirca, advises implementing a full data center asset and lifecycle management plan. "Use asset discovery tools and then make sure that assets are managed fully from there on," he says. For example, make sure that monitoring is present for fans and hot spots to detect problems early. If possible, use power monitoring at the rack and equipment level to pick up abnormalities before problems occur. Doing so will make maintenance a more



planned activity and minimize the chance of unplanned outages, he says.

✓ *Clean The Subfloor*

Having a clean subfloor can help improve the overall health of your data center. For example, the concrete pad and plenum under raised flooring can accumulate dirt and dust that falls through holes in the data center’s flooring. The cool air that circulates underneath the data center floor can carry away that debris and push it into the data center hardware, where the cooling is typically aimed.

Deposited dust can get into circuitry and clog system fans or foul up electronic equipment. Dust in fans can be a particularly dangerous problem for data centers

because the reduced airflow can cause servers to overheat, which can lead to repairs that cause downtime in the data center.

Just a few other hazards of particulates in your airflow include an increased fire risk and the possibility that fire suppressants will falsely identify the dust as smoke and release the fire suppressant onto your data center. Employees that are allergic to dust can also be affected by the environment, and a particulate-filled data center can negatively affect the health of IT staff and employees that regularly work inside the data center. In short, an unmaintained subfloor can create environmental, health, and safety hazards.

Regularly scheduled subfloor cleanings can improve equipment reliability. As part of the cleaning, perform a check of the

raised floor to find holes and openings in server cabinets to prevent bypass airflow, which can lower efficiency due to decreased under-floor static pressure. The end result of bypass airflow will be hot spots in your IT equipment, so you’ll want to seal up those holes in the raised flooring. Another benefit of sealing up the holes is that you’ll help to reduce the amount of dust and dirt that falls under the tiles, so you’ll spend less time cleaning the under-floor environment.

✓ *Keep It Clean*

Once your janitorial staff has had a pass and long after the outside cleaning team is gone, you must take steps to maintain the cleanliness of your data center. Creating a set of standards for your data center workers

is one way to cut down on cleaning costs and make future cleanings easier.

You should institute strict policies that determine which employees should enter the data center as well as their expected behavior once they are inside.

For instance, data center employees should take great care not to track dirt and debris into the data center. No food or drinks should be allowed anywhere inside the room or near servers and other important equipment. Plus, you’ll want to avoid bringing carts, pallets, or cardboard into the data center as these can damage your flooring and leave behind excessive amounts of dust and debris. In addition, consider using sticky mats near entrances to catch possible contaminants. [P](#)

✓ *Hardware Cleaning*

Hardware cleaning is probably the least likely type of maintenance to be forgotten, but it’s important to remember that your valuable equipment is likely where dust and dirt will settle if it’s been blown through the cooling system. It’s best to wipe down or vacuum the equipment, if possible, to rid it of the dust. Additionally, you should not use chemical cleaning agents on the equipment, because the chemical concentrations may be detected by environmental monitoring systems, and liquid may set off any leak detection systems your data center has in place.

✓ *Know When To Hire A Cleaning Service*

With most data centers tasked with cutting costs, it may make sense to avoid hiring data center cleaning services and try to do everything yourself. But most companies have janitorial staffs that are only experienced in cleaning general office environments. In the end, there are certain parts of data centers that should be left only to professional cleaning services.

It’s important that you don’t rush into choosing a data center cleaning service, because there are multiple factors to consider that may make one firm fit your needs better than another. Not every data center is created equal, and many of them have unique cleaning needs that not all cleaning services can address.

From the start, you should compare the reputations of possible cleaning services and the options they provide. Ask for company references from cleaning service providers and ensure that they have a well-defined process for cleaning the essential parts of your data center. You’re hiring these vendors to clean the spaces and equipment in your data centers that you aren’t able to, so you should make sure they will do a satisfactory job. Don’t forget to also compare the pricing options for different cleaning services.

BONUS TIPS:

✓ *Check Your Costs*

A lot of factors go into the overall price of a cleaning service, and you should make sure you get exactly what you’re paying for. Look at what is being cleaned for the price you pay and the level of cleaning being performed. There may be specific situations, such as after construction or in the wake of a disaster, where you will need more in-depth cleaning services. One type of cleaning may take more time than another, which could also affect the overall pricing.

✓ *Schedule & Verify*

Ensure that maintenance occurs according to schedules and use work dockets to verify everything that needs done is completed, advises Clive Longbottom, service director for business process facilitation at analyst firm Quocirca. “Try to consolidate and then plan so that maintenance is a rolling plan that has the least possible impact on the business.”

Prepare For 40GbE, 100GbE & Beyond

Start Eyeing Your Enterprise’s Networking Future Today

ODDS ARE PRETTY GOOD your enterprise has already moved to 10GbE. Odds are also good that despite this, you have wisely already turned an anticipatory eye toward an eventual migration to 40GbE or 100GbE. But how do you envision your enterprise’s networking future, including the benefits and potential pitfalls to upgrading, and know when the time is right to upgrade? Here’s some advice.

Envision The Future

Although larger data centers have already embraced 40GbE, and in some cases 100GbE, mainstream data centers won’t until they require the speed to carry the aggregate data load they handle, says Forest Preston, switch product manager at Supermicro (408/503-8000; www.supermicro.com). Conditions

such as latency and data transfer times concerning some critical applications can propel early adoption, however. “The technology is there, the standards are pretty well set, and the price curve will follow,” he says.

Mike Fratto, senior analyst at Current Analysis, says 100GbE is “off the table” currently for small to midsize enterprises because of costs, and it primarily only makes sense for cloud providers, Internet providers, and the largest enterprises.

Most servers use 1GbE links (often with two to four Ethernet interfaces), thus “moving to 10GbE, then 40GbE ISLs [inter-switch links] as the cost drops, makes sense,” Fratto says. Most enterprises likely aren’t pushing 10GbE ISL to capacity, he says, “so the next incremental uptick will be 40GbE.”

Alan Weckel, vice president at Dell’Oro Group, says enterprises beginning to deploy 10GbE servers or 802.11ac for campuses likely “will need to upgrade to 40/100GbE relatively soon.” Small to midsize enterprises, however, likely have no mid- or long-term need for 100GbE because they’ll likely shift those applications that need such bandwidth to cloud providers, he says.

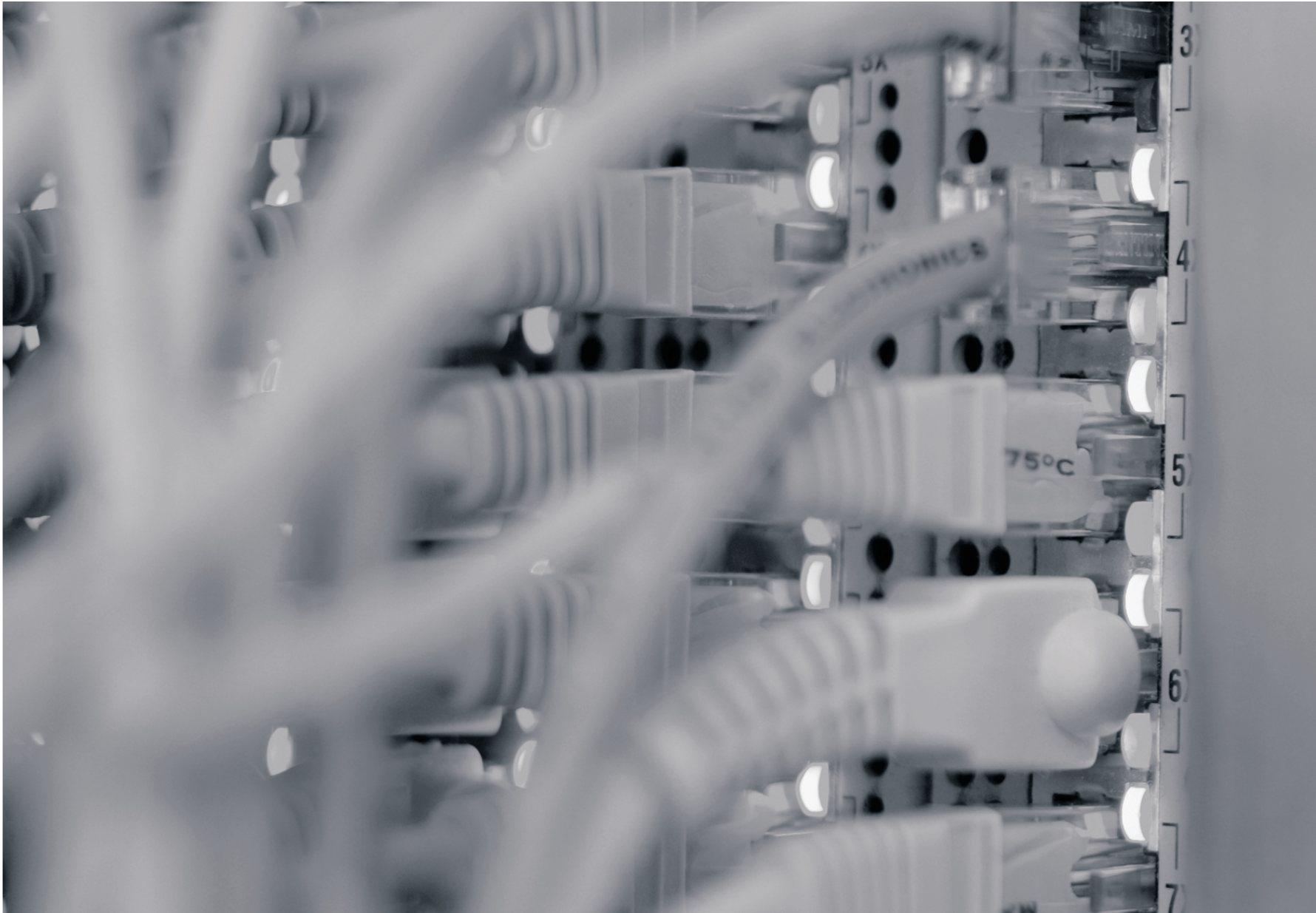
Enterprises that have migrated to 40GbE and beyond, Weckel says, are seeing benefits in application performance. Mostly, he says, “it’s in the aggregation layer of server access that’s allowing them to increase their application performance and the number of applications that a business can run at one time.”

Preston says 40 and 100GbE were designed with specific target applications in mind, with

Key Points

- Because of costs and other factors, most data centers currently are better suited for network migrations to 40GbE than 100GbE.
- Determining which applications you eventually plan to move to the cloud can influence future networking plans.
- Companies that have already migrated to 40/100GbE are seeing benefits in application performance.

100GbE applications targeted for service provider core and aggregation networks, metro core, and large campus core networks. 40GbE



applications are targeted for short-reach data center core and aggregation layers or top-of-rack server aggregation. “40GbE is also envisioned as the next logical speed for blade server access and server NICs,” he says.

Start Preparations Early

Starting preparations early is the key to a successful migration to 40 or 100GbE. Small to midsized enterprises can conduct valuable activities such as awareness, training, and personnel development, Preston says.

Weckel advises beginning to plan which portions of the data center will stay onsite and which will move to the cloud. This can help determine the bandwidth that applications will require and the bandwidth that users will consume. “This will enable them to consolidate

data center equipment as they move toward the cloud and deploy a campus network with enough bandwidth (either 40GbE or 100GbE) to support their users,” Weckel says.

Fratto warns that moving to 40/100GbE can be disruptive “because it means a whole new cabling plant, and few enterprises are paying attention right now.” Moving from 1GbE to 10GbE was an incremental change, he says, and if companies already had fiber installed, they could reuse it. “With 40 and 100GbE fiber, that old fiber plant won’t work because the new fiber cables will need 8-fiber cores for 40GbE and 20 cores for 100GbE. That 2-core fiber cabling that was supposed to last forever won’t work anymore,” Fratto says.


Matthew Butrimovitz, sales and marketing manager at Interface Masters Technologies

(408/441-9341; www.interfacemasters.com), recommends upgrading in stages using such equipment as a bypass switch, which he says can load balance a 40GbE stream to four different 10GbE appliances and then re-aggregate them back into the 40GbE stream. For companies that are willing to upgrade slowly and already have capable equipment in place that doesn’t immediately need to be switched out, the approach can get enterprises to 40Gb speed with existing appliances, he says.

“Going from 10G to 40G or even 100G is going to be an expensive ordeal,” he says. It’s important for companies to determine if doing a complete upgrade is worth the cost or if an upgrade over time as prices are simultaneously dropping makes more sense.

Embrace The Benefits

Generally speaking, says Supermicro’s Preston, the visible benefits of a 40/100GbE upgrade are “those that were seen in the transition from 1 to 10GbE,” specifically improved data movement and management, increased server resource availability, reduction in data bottlenecks, and higher server access speeds.

Enterprises that rely on their server networks to produce revenue for their businesses can expect to generate the greatest business value from upgrading their networks now, Preston says, and also see the highest net present value or ROI by migrating to the latest networking technologies. 

Top Tips

- ✓ Plan for the future by determining the applications you’ll keep within the data center and which you’ll move to a private/public cloud. This will help with decisions about the network’s architecture and bandwidth requirements.
- ✓ Work with an experienced vendor to schedule and implement a network upgrade to see benefits in communications, training, maintenance, and efficiency.
- ✓ When working to obtain a decision maker’s approval, have an overall data strategy and network architecture plan and be able to outline the benefits of a move to 40/100GbE.
- ✓ Enterprises that rely on server networks to generate business revenue can arguably claim the greatest business value from upgrading their networks now.

Action Plan

When beginning a network technology migration, Forest Preston, switch product manager at Supermicro (408/503-8000; www.supermicro.com), suggests doing so in conjunction with a server refresh and storage technology upgrade, as ignoring any one aspect “would invite disaster” because of potential unforeseen bottlenecks and inefficiencies. Beyond working with a vendor in these technologies, he suggests:

- Starting a network upgrade with a laboratory demo to iron out any kinks and bugs.
- Initiating a pilot project before a full-scale rollout of the new network technology occurs.
- Rolling out the new networking technology in stages.
- Starting with the highest speed core components and moving out to aggregation resources and individual server and storage units and interfaces.

Get Started

Forest Preston, switch product manager at Supermicro (408/503-8000; www.supermicro.com), says having the right human resources is the most important investment any enterprise can make when preparing for a new network technology. He suggests taking advantage of the training and experience that a vendor can provide on new technologies. Alan Weckel, Dell’Oro Group vice president, says small to midsized enterprises may need to invest in tools that automate tasks for application movement between the cloud and for the configuration of network resources to “keep up with the almost exponential increase in applications the enterprise will need to support in the coming years.”

SIX QUICK TIPS

Buy & Implement A Unified Communications System

Bring Your Employees Together With An All-In-One System That Matches Your Needs

THERE’S PLENTY OF GOOD NEWS related to unified communications, or UC, these days. Along with the well-known communication, collaboration, mobility, productivity, and financial benefits that UC can offer enterprises, because there is a growing number of UC vendors popping up to vie for your business, that competition can mean you’ll get a great deal on your system.

Unified communications combines your voice, email, instant messaging, video, and other systems into one network-connected system. This makes it easier for employees to connect with customers as well as with each other. Here are a few tips that will help you get started in the UC purchase and implementation process

and show you the benefits that unified communications has to offer.

✓ *Know What Your Network Can Handle*

One of the first steps in the UC implementation process should be evaluating your network to make sure it can handle the types of communication products you want to deploy. Make sure your network is reliable and perform a test to make sure the voice quality will be high and consistent across the enterprise. Be sure to implement quality of service measures to ensure voice and video traffic aren’t impacted by data traffic.

Once you’ve picked a system and have it ready to implement, consider running a trial deployment with a specific department

or other group of employees to make sure the UC system works as planned.

✓ *When Choosing A System, Prioritize Your Needs*

Determine what features will work best for your workforce. For instance, some departments may benefit from having extra tools, such as instant messaging and videoconferencing capabilities, but other employees may only need basic phone, email, and voicemail. Knowing the strengths of your network and the needs of your employees will help inform you on which peripherals will help fill out your unified communications system.

Robert Arnold, program manager, unified communications and collaboration at

Frost & Sullivan, says increased competition means customers have many options from an extremely broad selection of solutions and are well-positioned to take advantage of numerous incentives and increasingly friendly pricing.

Any search for a UC system should begin with an in-depth, extensive analysis of exactly what UC features the enterprise needs, both to satisfy the majority of users and for employees within specific departments and positions. Arnold says IT should also prioritize and deploy UC solutions that specifically address “known pain points that deliver tangible benefits to high-value employees and that support operational or performance improvement for the greatest number of employees.”





For enterprises that have limited internal support resources, Arnold recommends looking for UC designs that are easy to install, manage, and maintain. “Hosted or cloud-based UC services can also be employed to outsource complexity and provide predictable recurring costs,” he says.

Other cornerstones of a UC solution, he says, include rich presence and a fully integrated client. “Rich presence enables users to connect with colleagues at the right time via the right communication mode (IM, voice, or video), which provides the contextual capabilities that can make interactions more productive.” A unified client, whether accessed via desktop computer, Web browser, or mobile device, “makes the full range of UC applications (IM/

presence, call handling, VM/UM, conferencing, video, etc.) readily available to users, allowing them to choose the best channel for their current task and to seamlessly and dynamically escalate or switch media types as required,” Arnold says.

In your search and evaluation, consider a unified communications system that is based on the open SIP standard. This will ensure that it is flexible and cost-effective compared to traditional voice services.

✓ *Consider Your Budget*

When budgeting for a UC solution, factor in current infrastructure that you can integrate into a broader UC implementation, including PBX, messaging, email, and conferencing systems. Doing so will help

reduce upfront costs or “premises-based or hybrid CPE [customer premises equipment]/cloud investments,” Arnold says.

“Software licensing has become much more flexible and granular, enabling customers to more cost-effectively match a myriad of capabilities to the needs of individual users.” For example, deskbound knowledge workers, executives, road warriors, and teleworkers have widely varying requirements, he says, but “customers can save as much as 30 to 40% per user by contracting for application bundles that provide the appropriate features for each user type compared to a la carte application pricing. This licensing structure is becoming increasingly pervasive with premises-based as well as hosted/cloud UC solutions.”

✓ *Define Your Terms*

UC helps overcome time and distance barriers, but as Arnold says, “UC means many different things to many different people.” Rather than focus on definitions, he advises that IT “should focus on building solutions that can closely satisfy the requirements for their industry, user base, and local business environment.”

As for ROI, Arnold says, “Aside from the well-known operational benefits offered by IP-based solutions, user adoption and utilization are key factors in driving ROI.” Select solutions that use familiar user interfaces, are easy to use, and deliver a quality user experience to ensure employees take full advantage of the solutions you roll out. [P](#)

✓ *Go Into Detail With Your RFP*

Robert Arnold, program manager, unified communications and collaboration at Frost & Sullivan, advises businesses to create specific, detailed requests for proposals. “The most successful UC deployments are those that are tailored for each individual account; one size does not fit all,” he says. Additionally, demand multiple references from the vendor of implementations similar to what you’re considering and “evaluate not only the technology but also provider service and support.”

✓ *Face Your Challenges*

Although you can look at unified communications simply as another communication solution, if you haven’t identified the obstacles to this type of project management, here are some issues you might have to address now or in the future:

- **Application performance pitfalls.** The end user should be taught that new UC applications may be buggy at first and require a learning curve. Make sure you budget for comprehensive support, so your employees feel comfortable learning new technologies.
- **Unpreparedness for interoperability and integration issues.** Different vendors offer different interworking options, so it’s important to be aware of how certain solutions will fit into the larger communication infrastructure.
- **Bandwidth taxation.** Before you deploy applications, consult your IT department to find out what type of strain new UC tools will place on your existing network. For instance, rolling out a videoconferencing platform across the enterprise will require more network throughput.

BONUS TIPS:

✓ *Think For Tomorrow*

“Deploy for today but think longer-term,” says Robert Arnold, program manager, unified communications and collaboration at Frost & Sullivan. IT should investigate UC solutions that enable the enterprise to migrate and adopt new capabilities at its own pace, “both today and over time as their requirements change.”

✓ *Continue Education*

Implementing your unified communications system is only the beginning. Technologies will continue to change and it will be up to the IT department to educate employees on how to best utilize UC to improve day-to-day interactions with each other and with employees. Train your staff on how to use the new system and make sure your employees understand the features and benefits that are important for them.

SIX QUICK TIPS

Solve BYOD Security Issues

Tips To Set Policy, Protect Company Data & More

WHEN EMPLOYEES USE their own mobile devices for work, enterprises reap numerous potential benefits, including cost savings and enhanced productivity, collaboration, and communication. BYOD also introduces numerous headaches, including security-related ones. Here's a look at common issues and how to address them.

✓ *Know What Could Happen*

Most security issues boil down to sensitive information getting where it shouldn't, says Mike Battista, consulting analyst at Info-Tech Research Group. BYOD makes this easier because IT has less control over personal devices and device owners may not be as careful with data as IT would like.

Michela Menting, ABI Research senior analyst, says a common BYOD-related issue is inadequate security on personal phones that can access corporate email, IM, and other productivity apps. Beyond failing to configure screen PINs or passwords or use mobile VPNs, users may also copy documents from email and insecurely store them on the phone, she says.

Eric Ahlm, Gartner research director, says the most common issue is data loss through access by unsecured systems. "When you don't own or manage a device accessing your data, securing it becomes a difficult task," he says.

Dionisio Zumerle, Gartner principal research analyst, says embracing BYOD means companies are willingly putting

enterprise data on unknown, uncontrolled, untrusted, unmanaged devices, which "has all sorts of security implications." You can do BYOD securely and deliver benefits, he says, but not without some drastic changes in terms of posture.

✓ *Start With Policy*

Before implementing BYOD, Battista advises conducting research and planning. "Some organizations might realize that they really don't have much sensitive information to worry about, so a broad and unrestrictive BYOD program will suffice," he says. Companies with lots of sensitive data, however, need carefully thought-out technologies and policies in place before proceeding with BYOD, he says.

Zumerle views a BYOD policy as "the heart of the entire exercise," as policy "translates the architectural and technical decisions into impact to the user and her device."

Policy should explain what users can and can't do (including with corporate data) and how. "It's pointless to purchase mobile security tools to enforce BYOD without a thorough mobile policy definition initiative," Zumerle says.

Menting says policy should cover securing the device, data, and communications. Policy should also include recommendations for user conduct, complete with explanations. "This will help earn greater trust. Simply detailing the dos and don'ts risks alienating employees," she says. Providing explanations will ensure greater






adherence to policy while also educating employees about security.

✓ *Protect Your Data*

One common approach to securing data is containerization, in which a “container” that the company owns secures company data on a platform the user owns. Zumerle believes companies should stop trying to manage devices to secure data and instead protect the data itself, which means “defying a 30-year-old endpoint security model.” Most organizations now use mobile device management software to enforce mobile policy on the entire device, he says, but containment techniques will increasingly reduce the range of action of the policy until it reaches a single mobile app. “This

will take place gradually, as mobile security matures along with enterprise mobility.” Battista says MDM and other security technologies can add an extra layer of security and enable IT to enforce policies, “but it’s the user policies, dictating employee behavior, that I think matters just as much.” Employees, for example, should know how to safely access sensitive data, what limits are in place for using their device for work, and what to do if the device is lost. Often, he says, employees don’t find out about policies until they need enforced, which is usually too late. “There should at least be an attempt to train employees before it ever becomes an issue.” At the least, Menting says, BYOD security should include configuring a screen PIN or password to protect against unauthorized

access and a mobile VPN to ensure corporate-related communications are encrypted. If allowing access to and download of corporate documents to devices, password-protect or encrypt them, she says. Also, remote data wipe, backup, and restore abilities are useful if a device is lost or stolen, she says. ✓ *Accept Responsibility* Who is responsible for securing an employee-owned device used for work? Gartner’s Ahlm says companies are always responsible for their data. “Don’t expect a user to do the right things to secure your data for you,” he says. Although a containerization strategy can make a clear demarcation between data owner and device owner to allow companies to secure their data regardless of the device, he

says, some data-loss risks can remain. “If data loss is too risky, then a BYOD strategy may not be the best option,” he says. No matter what goes wrong, Zumerle says, customers will hold the company accountable. Thus, companies need technical control in place to prevent BYOD disasters. Ultimately, however, “you’ll need to slightly increase your risk appetite and trust your users a bit more to embrace BYOD.” Menting advises setting limits but also limiting imperatives. “It helps to be absolutely clear on how imperatives work and their effect on the device,” she says. “Essentially, though, security will in large part be down to the end user.” Here, a well-drafted policy can go a long way toward encouraging employees to take certain actions, she says. 

✓ *Selectively Wipe Data*

Info-Tech Research Group consulting analyst Mike Battista says remotely wiping data on devices brings up the issue of security for personal data. “Employees may have priceless photos on their devices that are just as valuable as corporate data, and should a company really have the ability to destroy them with the click of a mouse?” he says. Selective wipe, or wiping only corporate data and leaving personal data untouched, is a big improvement, he says. Some devices can do this natively, and mobile device management vendors do their best to enable it on other devices, he says. Selective wipe can also ease the process when employees leave the company, as IT can wipe all company data.

✓ *Deal With Departing Employees*

Inevitably, employees quit, leave, or are fired. A BYOD policy needs to define how to deal with such employees also participating in a BYOD program, says Gartner research director Eric Ahlm. “The employee will take their device; it’s theirs,” he says. “The question is what risk does that present to corporate data?” Ideally, companies should have controls in place to ensure no data remains on the device upon termination, he says. ABI Research senior analyst Michela Menting says companies should have a remote data wipe function available for such situations. Though most employees can be trusted to do the right thing, she says, companies need some sort of contingency plan in case of such an event.

BONUS TIPS:

✓ *Strengthen Your People*

ABI Research senior analyst Michela Menting says ultimately “people are generally the weakest link” security-wise, with many breaches/leaks happening because employee didn’t take security seriously enough. “The employee has to accept that allowing their device to become a productivity tool for the company means that the company has to be allowed some leeway in terms of securing the device,” she says. Enabling companies to remotely wipe data, for example, is a “price employees have to pay” in return for using their devices for work, she says.

✓ *Enforce Policy*

Rob Enderle, principal analyst at Enderle Group, says improperly secured and unreported lost phones are common BYOD security worries. Beyond increasing penalties for policy non-compliance, he suggests spot audits of phone security and confirmation phones are still with employees. “Make sure the employees are motivated to report the lost phone as soon as possible,” he says. “Assure the penalties for not reporting are significantly greater than the penalties for losing the phone.”

SIX QUICK TIPS

Renovate Your Data Center

Account For Cooling, Fire Protection, Disaster Recovery & Other Considerations

ENTERPRISES UNDERTAKE data center renovations for a variety of reasons, including equipment upgrades or a complete overhaul to change the layout or overall size. Renovations provide ample opportunity to look at your entire data center and pinpoint systems such as cooling and fire protection that could use an overhaul. It's important not to limit yourself to the usual suspects but instead think outside the box and improve your data center in ways you may not have previously considered.

✓ *Alternative Cooling*

A renovation provides the perfect opportunity to look at new cooling technologies and approaches. For instance, David J. Cappuccio, research vice president at Gartner, says some

companies may consider whether they can bring in outside air as a cooling mechanism or use outside air as a heat exchange mechanism to reduce cooling costs. But those same data centers may use a renovation as a reason to implement a brand new cooling system.

"With liquid cooling, you have to bring in a cooling distributor on the floor, which is no bigger than a rack," Cappuccio says, so if you're adjusting your room layout, you could make room for a new piece of liquid cooling equipment. Cappuccio says the benefit of implementing liquid cooling is that "when you're done, 95% of your cooling is done with liquid instead of with forced air," which can result in "45% of your total energy cost" disappearing "because you're not cooling all of that IT equipment" with air.

Cappuccio says liquid cooling is much safer than it may have been 20 or 30 years ago when most data centers had mainframes. Most liquid cooling systems use a low-pressure refrigerant that, in the event of a pipe break, will actually "turn into an inert gas when it's exposed to the air," he says.

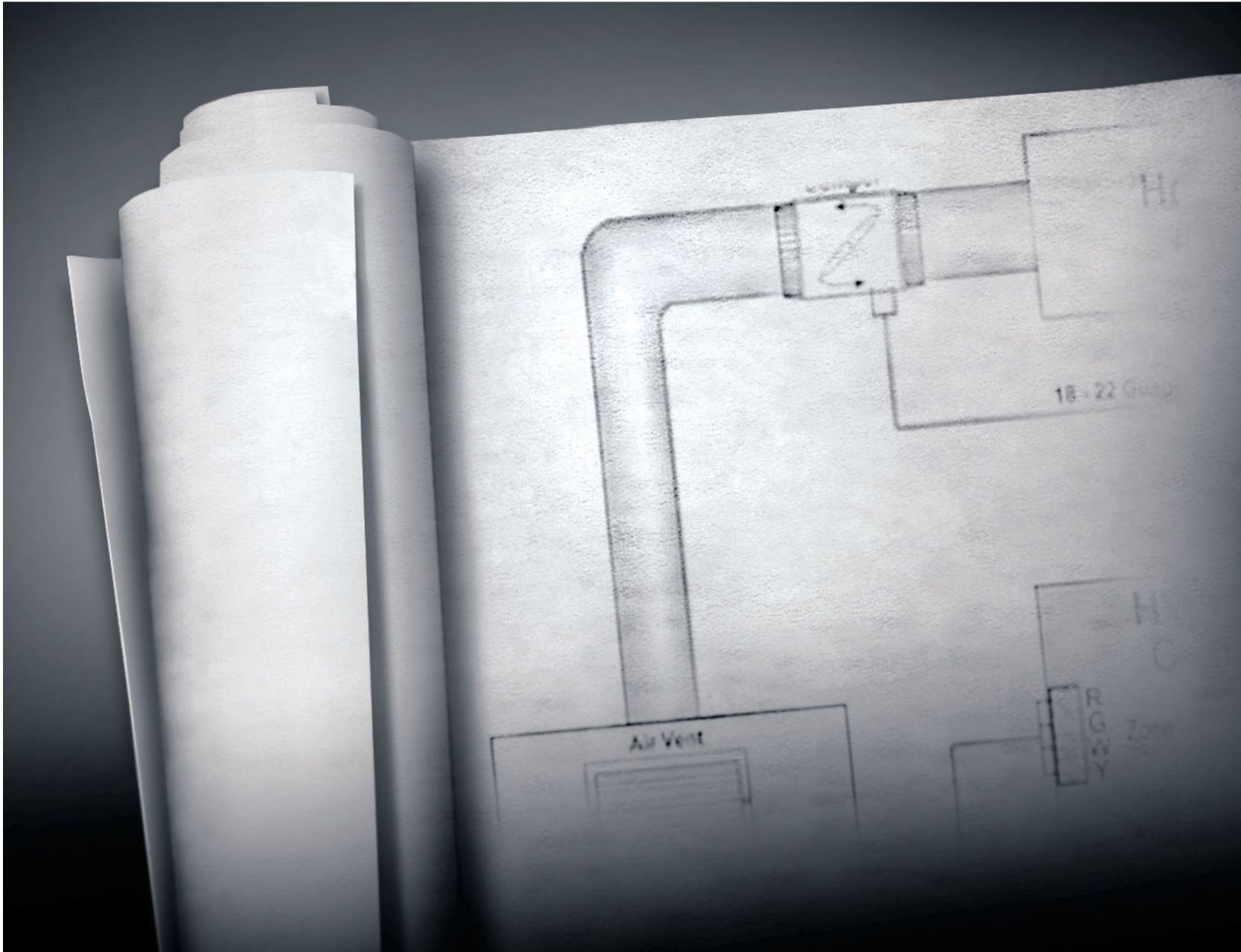
✓ *Fire Protection Strategies*

Consider your fire protection and suppression system during a data center renovation, says Darin Stahl, principal consulting analyst at Info-Tech Research Group. He says that many companies are paying for extensive dry chemical fire protection systems that are built to "flood the room with chemicals" in order to suppress a fire. But just as you can use liquids for precision cooling by running

pipes through your racks, you can also use a similar approach for precision fire protection by implementing a dry-pipe system inside of closed racks and then utilizing wet misting systems for the rest of the room, Stahl says. If one rack catches fire, you can put it out with targeted suppression instead of blanketing the entire room. This helps prevent unnecessary downtime due to cleaning up dry chemical residue throughout the facility.

✓ *Business Continuity & Disaster Recovery*

Data center renovations are usually aimed at improving performance or consolidating equipment, but also consider how to protect your business in case of a disaster. "People are starting to tie business continuity and disaster



recovery planning into data center strategies, which sounds like an obvious thing, but historically was never done,” Cappuccio says. “It was always a secondary project. You created a data center strategy, built the data center, and then somebody got a side project to start deciding what disaster recovery is about.”

Now, companies are considering whether they need an offsite data center in addition to their current facility. This is particularly beneficial during renovations, because you could “free up space or get riskier systems out of the room and put them in the secondary space temporarily,” Cappuccio says. But you could also use this secondary, and potentially smaller, facility as “an augmentation strategy” for growth. In essence, a second data center “becomes a workable environment that can be

used for both business continuity and migration strategies.” You’ll always have a facility ready to go, so that even during a renovation, your business will run as usual.

✓ *Effects Of New Technology*

Cappuccio says that when most data centers start a renovation, they perform a “linear analysis” where they determine how many storage solutions, for example, they have and what their percentage growth is each year. Then, they “extrapolate that over the next 10 years to know how much storage they’ll need and how much floor space they need for the racks,” he says. Instead, he recommends companies keep Moore’s Law in mind during planning and understand that every new generation of technology is often smaller than the last. “If you

apply those generation changes and Moore’s Law to growth, you find out that the floor space you think you’re going to need is a lot less than you originally planned.”

Stahl agrees and recommends that companies create a technology or infrastructure road map that clearly shows what types of technology the data center should be interested in based on their current and future needs. He uses the example of solid-state storage, which is “on the tip of everybody’s tongue right now.” But if your company doesn’t currently have a business need for SSDs, then you may not be able to justify the price. Still, you should include solid-state storage in your technology road map, because as the price goes down, it may prove to fit your future business requirements.

They key to getting out ahead of technological innovation is to opt for modularity as much as possible during renovations and retrofits and to also implement solutions with room to grow.

For instance, Matthew Butrimovitz, sales and marketing manager at Interface Masters Technologies (408/441-9341; www.interface-masters.com), says that data centers with networks currently running at 10Gb may want to implement a solution that not only supports 10Gb, but also 40Gb. “You can have 1G, 10G, and 40G blades that can be taken out or in as you upgrade your network rather than having to upgrade the whole system,” he says. It’s that level of flexibility that will make future renovations and upgrades much easier. [P](#)

✓ *Cloud & Hosted Considerations*

With cloud computing and hosted services becoming such a large part of the business world, data centers are finding that their equipment and infrastructure needs are dwarfed by the sheer size of their facilities. “I’ve been in a data center recently where it all of a sudden had about a third of the equipment and racks in it and three-fourths of the floor was open,” says Darin Stahl, principal consulting analyst at Info-Tech Research Group.

That same data center had to put up temporary walls to help with cooling issues, but it still has those systems and power equipment in place, whether it uses them or not, Stahl says. That’s why he says it’s so important to look ahead at where your workloads will be in the future, even if they’re currently in-house. If you plan on taking advantage of infrastructure- and software-as-a-service hosting, then you should take steps now to consolidate your data center.

✓ *Seek Expert Advice*

David J. Cappuccio, research vice president at Gartner, says that one of the mistakes data centers make during new builds and renovations is relying on their own internal expertise rather than seeking outside help. It doesn’t mean that your IT team doesn’t know what it’s doing with the equipment and data center in general; it’s just that for most of them, it’s the first time they’ve ever done it, he says.

“Go and get some outside expert, an engineering firm or design firm, just to do what’s called a data center assessment,” Cappuccio says. “They’ll come in and tell you what you have now and what you could potentially do with [your data center].” He says that the data center design experts can give you a high-level perspective of your facility’s capabilities.

BONUS TIPS:

✓ *Expand Your Network*

Matthew Butrimovitz, sales and marketing manager at Interface Masters Technologies (408/441-9341; www.interfacemasters.com), says that data centers should create a diagram of their network when they contact vendors during a network infrastructure renovation. With a network diagram, he says, you can point out what security products, switches, and firewalls you have in place and the vendor can tailor a solution and strategy that will meet your current and future needs.

✓ *Avoid A Narrow Focus*

Darin Stahl, principal consulting analyst at Info-Tech Research Group, says many data centers will focus on one thing to renovate and “look at it in isolation.” The problem is that “the knee bone is connected to the shin bone, and they’re all a part of a larger system of delivery and an ecosystem,” he says. It’s crucial to come up with a list of requirements for your data center as a whole that covers all aspects, because performing one small renovation may not solve all of your problems and could, in fact, cause new ones.

Troubleshoot, Maintain & Manage Solid-State Storage

Proper Use Can Help Prevent Data Center Disruption

SOLID-STATE DRIVES (SSDs) are great because they provide a high level of performance and are more durable than HDDs because they don't have moving parts. On top of that, the price continues to go down with every new innovation.

But SSDs can be potentially disruptive if not used correctly. That's why it's important to put SSDs in situations where they're most likely to succeed and be able to maintain and manage them based on their specific needs and quirks.

✓ *SSD Troubleshooting Isn't Necessarily Unique*

It's easy to think that because SSDs are faster and have a different design than hard drives that maintenance and troubleshooting

could be a unique challenge. But in practice, an SSD drive is "just another storage media, and what you do with an SSD when it fails shouldn't be any different than when an HDD fails," says John Sloan, lead research analyst at Info-Tech Research Group.

Although SSDs require locating a bad sector and troubleshooting the drive in personal systems, he says, data centers are primarily concerned with replacement. As with an HDD, Sloan says that you "want to be able to replace it but not lose your data."

Because SSD technology is relatively new, companies "can't look back and say, 'our SSDs have lasted for six years,' because most organizations haven't had them that long," Sloan says. You want to make sure you have the proper support

arrangement with a vendor that has had experience with SSDs from the beginning.

Even though SSDs are generally more reliable than HDDs, it doesn't mean they won't fail. That's why you need to have redundancy and backup strategies, but you also want to understand your warranty and available vendor support. For instance, some vendors may offer a 24/7 replacement policy or 24/7 support to help you troubleshoot issues when necessary.

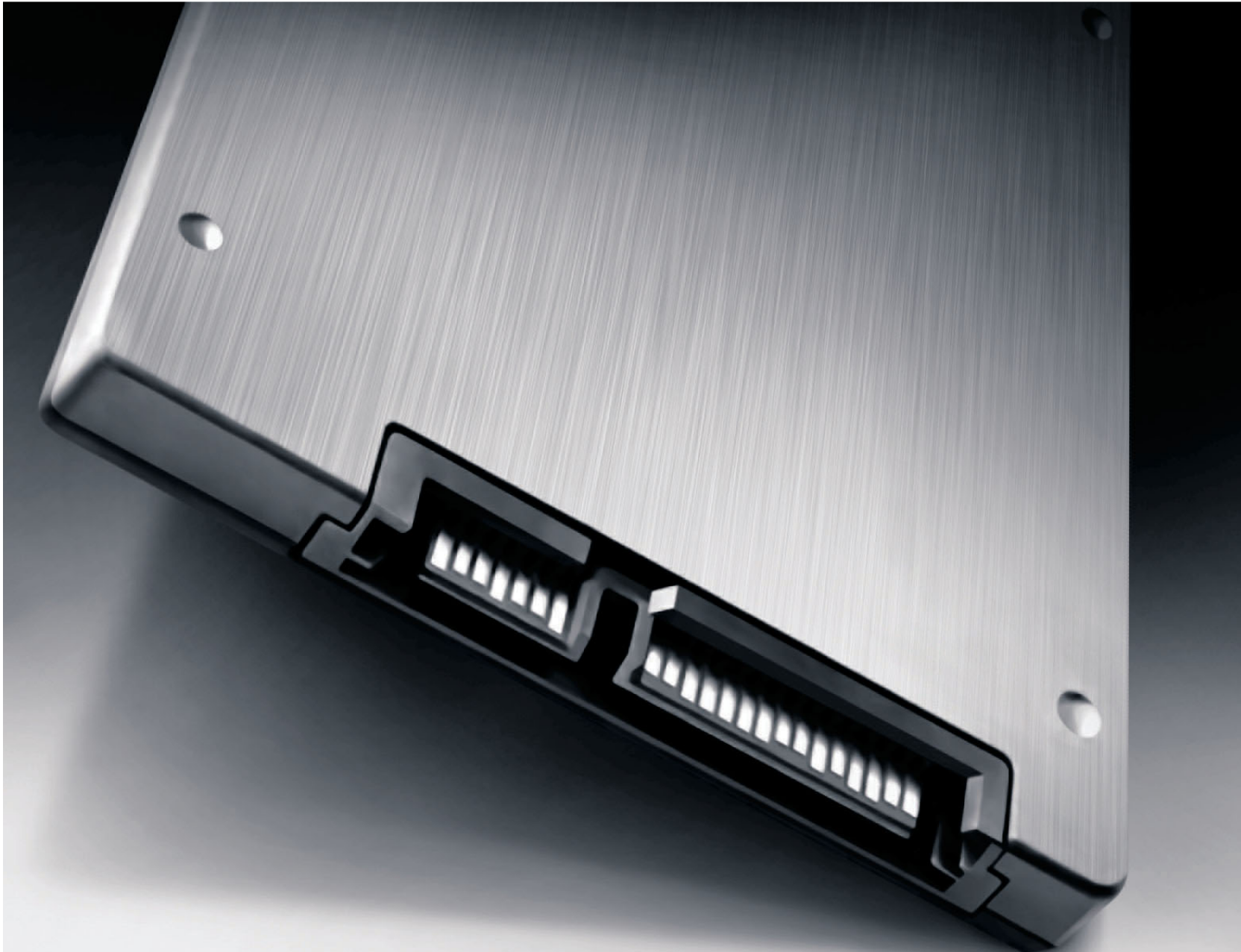
✓ *Take Data Write Limitations Into Account*

SSDs have many potential use cases that take full advantage of the technology, including storing virtual machines or applications with intense data read requirements.

But one aspect of SSDs that separates them from their HDD counterparts is that they often have a distinct write limit.

SSDs use flash memory, which means they don't have moving parts, but they can wear out. Henry Baltazar, senior analyst at Forrester Research, says single-level cell (SLC) SSDs have an endurance rating of about 100,000 write cycles, which means you "could overwrite media 100,000 times before it stops accepting writes." Enterprise-grade multi-level cell (MLC) SSDs support about 30,000 writes and consumer-grade MLC SSDs support about 10,000 writes. Although these numbers are estimates, they give you an idea of the potential limitations.

The key to taking advantage of SSDs is to use them for read-heavy applications.



For instance, Baltazar says that databases are a good candidate, because they are usually 70% reads and 30% writes. With an SLC SSD, it would take a long time to reach 100,000 writes. In write-heavy situations, such as for backing up data, you should consider using HDDs instead. This will not only ensure the best possible performance for both drives but also help improve your cost-benefit ratio.

✓ Upgrade From HDD To SSD

If you’re switching from HDDs to SSDs, be sure to account for a learning curve, Baltazar says. “If you’re transitioning from a tier 1- or tier 2-class system, you’re used to using the established vendor’s tools,” he says. If you get rid of your older system,

the new one will have its own management tools, which could create a bit of a learning curve and a disruption to regular performance. Consider this whenever you make a product or vendor change because you have to be aware of functionality, supported applications, and many other issues that could affect your storage management approach.

This same issue can occur when you start to introduce hybrid storage environments. If you switch out a few HDDs in an array with SSDs but you don’t have a clear idea of where those drives are in the array, then you may not be able to tell if you’re using them efficiently. One way to avoid this is to purchase a new array at the time you need an upgrade, which may not be an option for all data centers. Many established

vendors offer hybrid solutions that are already well-integrated and, Baltazar says, other smaller startups offer all-flash models. If you know your priorities, then you may be able to buy an entirely new array and get the performance you need without mixing and matching.

✓ Challenges With SSDs Inside Servers

There are unique challenges to installing SSDs inside servers rather than keeping the drives solely in an array, Sloan says. “One of the good things about a storage array is that you have redundancy and replication and snapshots, and you use multiple disks running in aggregate so that makes sure that if a single hard drive dies, you

don’t lose anything,” Sloan says. But putting SSDs in servers could cause potential issues if one of the drives fails.

“Say you have a high-intensity database system,” Sloan says. “If you can load that entire database on an SSD in the server, it will perform a lot faster.” But you don’t have the redundancy and replication that you had in a storage array. If the SSD dies or data becomes corrupt, you’re going to be in trouble, he says.

“You have to make sure that you have sufficient data management in place so that the live data is in the server on the SSD but continual backup is going back down to a storage array somewhere. Then, if the drive does die, it’ll trigger a maintenance process where you get a replacement, but you don’t lose your data.” P

✓ Considerations With Encryption & Data Purging

Joseph Unsworth, research vice president at Gartner, says that IT administrators need to look at encryption on SSDs “in sensitive environments” in order to protect the data stored on those drives. He also says that companies need to be careful how they purge data from SSDs if they are upgrading to a new drive or reselling ones they no longer use.

“It’s important to recognize that to fully purge an SSD of its contents, you have to make sure that all of the data is removed, which includes any metadata vestiges,” he says. “You want verifiable proof from a reputable vendor if you purchase purging software. Encryption is the way to go, of course, to avoid these issues.”

✓ Focus On Efficiency Rather Than Extending Life

Because SSDs are not all that different from HDDs in terms of troubleshooting, John Sloan, lead research analyst at Info-Tech Research Group, says that it isn’t as important to prolong the life of the SSD as much as having “management that will make sure you’re getting the optimum usage out of that SSD for the cost.” Because SSDs are generally more expensive than HDDs, be sure to consider data storage and usage.

“If you have a lot of non-high-traffic data that is sitting on SSDs, and you have to buy a lot of capacity, that’s really wasted,” Sloan says. “That capacity could very easily be stored on traditional spinning disk. In terms of management of data across SSDs and other layers, like spinning disks, you want to make sure you only have enough capacity or good enough capacity for those high-IO-intensive workloads. And when the data is not high-intensity, it should be moved to something else. That’s how you get the most out of that SSD.”

BONUS TIPS:

✓ Not All SSDs Are Created Equal

Joseph Unsworth, research vice president at Gartner, says that not all SSDs are built to the same quality standard and that it’s important to buy from a vendor you can trust. “While most failure rates of SSDs are well under 2%, the best are around 0.5% and come from leading vendors who not only possess flash manufacturing abilities but also have solid flash controller expertise,” he says. “There are many good ones out there, but if the price is too low, it could be due to lower quality.”

✓ Future Innovation

Henry Baltazar, senior analyst at Forrester Research, says data center managers should think ahead to see how SSDs might evolve in the future or how they could be used to improve other aspects of the data center. “One of the benefits of SSDs is that they’re not as vulnerable to high heat as a hard drive,” he says. “You could potentially see a transformation of data centers in the future where you don’t have to have as much cooling and you could have higher densities.”

BUYING TIPS:

PDU



PDUS HAVE EVOLVED into integral components of a modern power distribution infrastructure. Here’s what to look for.

✓ *Take Inventory Of Your Needs*

Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says to do your homework prior to making a PDU purchase. “It is critical that the PDU you select match up with your power consumption needs and server/network equipment.”

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says you need to know how many amps are needed to support your devices. “You also need to know how much power the devices in the rack will draw, being mindful that you have the right voltage and amperage numbers.”

✓ *Understand The PDU Options*

Femrite says there are three types of PDUs. A basic PDU lacks monitoring and remote administration capabilities. A metered PDU adds the ability to track amperage and management software to monitor the aggregate current being drawn on each PDU. Switched PDUs add local and remote control capabilities on a per-outlet level. Redundancy is important, Femrite says. A dual-circuit PDU offers fault tolerance with two power inputs.

Koty says your uptime goals influence the PDU you purchase. “Inexpensive basic rackmount PDUs may distribute power effectively, but they offer little if any understanding or control of the critical energy flow.”

Alex North, director of business development at BayTech (800/523-2702; www.baytech.net), says most rack PDUs look similar. “Evaluators need to open up the hood of all PDUs they are considering and use sound engineering-based judgment to evaluate the method of power distribution the manufacturer employed in the strip.”

✓ *Consider Mounting & Outlets*

Gina Dickson, director of infrastructure products at Black Box (877/877-2269; www.blackbox.com), says buyers often forget about mounting. “They purchase a vertical PDU and then realize after it arrives that it doesn’t mount into their cabinet. One way to avoid this is to purchase PDUs and cabinets/racks from the same manufacturer.”

Koty notes that horizontal PDUs take up rack space normally reserved for equipment. “If you can’t reserve horizontal space in the rack for the PDU, consider a vertically mounted PDU.”

Make sure PDUs have the correct outlets and outlet counts, says Andy Grav, technical

sales engineer at HM Cragg (800/672-7244; www.hmcragg.com). Koty says you also need to know which types of plugs devices use so you buy PDUs with appropriate receptacles.

✓ *Think Intelligent*


“When thinking about PDUs, think intelligently,” says Carrie Higbie, global director of data center solutions and services at Siemon (860/945-4200; www.siemon.com).

The real-time monitoring capabilities of intelligent PDUs help spot and prevent problems, she says. Alarms should identify power and environmental problems and provide the ability to remotely restart or shut down equipment. “The cost delta between basic

PDUs and fully featured intelligent PDUs is negligible when compared to cabinet equipment and energy costs,” she says.

Today’s lights-out data centers are using switched and managed PDUs, Grav says. “Both of these options allow the end users to monitor the data center from a distance while still having control of the equipment,” he says.

✓ *Account For Growth*

Make sure the PDU can handle your needs now and into the future. “If you don’t precisely match up the PDU with your power consumption needs, taking into account anticipated growth/increases, you can wind up having a breaker tripped,” Femrite says. 

BUYERS’ CHECKLIST

Bob Parente, sales engineer at Server Technology (800/835-1515; www.servertech.com), recommends asking these questions when selecting a PDU:

- ✓ What is the expected maximum power needed to the rack and what voltage can be supplied to the rack?
- ✓ Does the expected max power include planned power redundancy and growth?
- ✓ Will each rack be designed for power redundancy with a standard A and B Input feed configuration? What racks are being used (mounting considerations)?
- ✓ What types of devices are being connected in the rack? Do you know the power factor for the devices within the rack? How many and what types of outlets are required?

KEY TERMS

basic PDUs

The least expensive PDUs; they offer simple power feeds with no extra features.

metered PDUs

Typically provide an illuminated status display measuring the load level, a handy feature when balancing loads.

smart or intelligent PDUs

Any PDU that offers Web-based management, meter power at both the PDU and individual outlet level, and real-time power monitoring.

switched PDUs

Connect to the network and offer the features of metered PDUs and remote on/off control of outlets.

BUYING TIPS: KVMs



THERE’S LITTLE DOUBT that KVMs offer plenty of options. Brett Femrite, Rackmount Solutions director of business development (866/207-6631; www.rackmountsolutions.net), says models include simple desktop options that control a handful of computers up to enterprise-level, IP-based KVMs with integrated matrix switching that let multiple users simultaneously access different devices.

✔ *Pick A Knowledgeable Vendor*

If you don’t have time learn about all of the offerings, carefully consider the aptitude of the vendor partner you are working with, says Jeff Clark, president of Lindy USA (888/865-4639; www.lindy-usa.com), and be transparent about your needs and future growth plans. “A good KVM vendor can help place the right system in your hands, but in order to do that, you must take the time to include this vendor in the initial planning stages,” Clark says.

✔ *Consider Security*

Buying a KVM with secure IP remote user access is essential to reducing manpower and negating the need for onsite operation by enabling administrators to gain BIOS-level access to servers, says Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com). A KVM over IP switch uses an encryption protocol that will help secure the data you send over the network.

Femrite says you need to consider automatic time out, which disconnects users after a specified period of inactivity. Permissions-based access rights are a priority feature for data centers with multiple users accessing the enterprise’s devices. These rights grant specific users access to only the devices and administration levels they need.

✔ *Check For Devices & Users*

KVMs have a limited number of servers and devices they can directly control. Will Beene, rack specialist and technical account manager at Rack Solutions (888/903-7225; www.racksolutions.com), says you need to know how many users can be supported both locally and remotely. KVMs are offered in a variety of port densities, so you should be able to find one that perfectly fits your needs.

Yim says you can reduce KVM hardware expenditures and simplify management with a KVM that offers simultaneous multiuser access from different locations on devices connected to the same KVM switch.

✔ *Factor In Compatibility*

Be sure to account for compatibility, Femrite says. Determine the number of devices you want to connect, hardware devices you’ll connect to it (mouse, keyboard, monitor), and the connection types (USB, PS/2) you need. Compatibility with the monitor you’ll connect the KVM to (DVI or VGA) is also essential.

Mike McCurry, product manager for high-performance KVMs at Black Box (877/877-2269; www.blackbox.com), says one common mistake is purchasing different types of equipment from different manufacturers. “When performing the initial installation and configuration, 90% of these users will realize very quickly that they will have many compatibility issues on their hands,” he says.

✔ *Determine The Distance*

Determine the maximum distance you need to connect devices to the KVM. “If further than approximately 25 feet, you should opt for a CAT 5 cable vs. the standard KVM cable kit,” Femrite says. If the servers are too far away for the cabling to reach, use a KVM extender.

Yim adds that CAT 6 KVMs can minimize distance-related problems as a CAT 6 cable with interface dongle can support up to 130 feet without signal weakness.

“KVM over IP allows the servers to be further away from the KVM switch; however, Service Access Modules (SAMs) are required,” Beene says. “You have to weigh the cost vs. the benefits. In large organizations with distributed systems, KVM over IP is an easy method of administration and management.”

✔ *Plan For The Future*

Make sure you put some thought into how you’ll use the KVM now and into the future, McCurry says. “The most common mistake I see is buying a KVM switch that will solve your problems for today only,” he says. “When viewing KVM switches, think about how many more computers/servers you plan on adding in the upcoming months and years. You do not want to fully populate a KVM switch right away and discover you have to get the next size up or find a completely different solution.” P

KEY TERMS

cascading

Connecting KVM switches together in a chain by attaching one switch to the computer port of another.

converter

Converts the KVM signal from one platform to another.

matrix switching

The ability to have multiple users access multiple target devices independently.

BUYERS’ CHECKLIST

Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com) offers this list of features to look for:

- ✔ Do you need traditional DB-15 cables or CAT 6 cables with an interface dongle?
- ✔ Do you need a single local console or multiple consoles with IP remote access features?
- ✔ Will the KVM be standalone or integrated with an LCD keyboard drawer?
- ✔ Will you have a single user or concurrent users?
- ✔ Does the KVM have multiplatform connectivity so you can mix legacy hardware platforms between DVI, USB, PS2, and Sun solutions?

BUYING TIPS:

Fire Protection



IN AN INSTANT, a data center fire can devastate a business. Beyond downtime, there’s equipment damage, escalating insurance rates, and other related costs—hence the need for fire protection and suppression systems. Here’s what you need to know when selecting a fire protection system for your data center.

✓ Understand The Basics

Chris Jelenewicz, P.E., engineering program manager at the Society of Fire Protection Engineers, says there are several factors to consider when installing fire protection systems, including the building’s structure, occupants, first responders, and equipment. Jelenewicz says both active fire systems (sprinkler, gaseous, alarm and communications, smoke management, etc.) and passive fire systems (fire doors, walls, etc.) are necessary to protect people, property, and structures. Both system types “should be designed so that they work together as one complete fire protection system.”


Melanie Davy, analyst at Info-Tech Research Group, says at a minimum, a data center must have a sprinkler system, fire detection and alarm components, portable fire extinguishers, and emergency power-off abilities (according to NFPA 75). Other forms of protection, such as clean-agent suppression systems, are classified as add-ons.

✓ Decide Between Water & Non-Water Options

Fire protection is generally divided into water and non-water options. The obvious downside to using a sprinkler system is that electronic devices and water can be a bad combination, especially in situations that are started by electrical fires. Thus, most data centers opt to go with a clean agent or aerosol agent suppression system, which is designed to leave no residue and is safe for both electronics and people, unlike some chemical-based fire protection.

✓ Know Your Alert Choices

You’ll need to know at what stage during a fire the detection system should trigger the suppressant to release. Effective detection is key, as the suppression system is only as good as the detection system initiating the release.

Invest in a smoke and fire detection system that can alert employees and IT staff to problems. Some models are capable of detecting the various stages of a fire, such as visible smoke, flaming fire, and intense heat, to allow you to set off alarms or activate various stages of fire protection. 

BUYERS’ CHECKLIST

- ✓ Find a smoke/fire detection system that meets your needs in terms of stages of fire protection and number of physical detection locations.
- ✓ Research the various clean agent suppression options and make sure your sprinkler system can work with the clean agent suppression system.
- ✓ Invest in an emergency power off system to shut off electricity when a fire is detected.

KEY TERMS

aerosol agent

A type of fire suppressant system that leaves little residue and won’t damage equipment. The agent does not require a sealed air-tight space as it does not pressurize the protected area when discharged.

agent storage container

The assembly or unit that stores the clean agent fire suppression liquid until it needs to be released when prompted by the suppression control panel.

Class C

Fire breakouts that involve electrical equipment where a non-conductive extinguishing agent must be used.

clean agent

A type of fire suppression system that leaves no residue.

deluge

A system where all the sprinklers connected to the water piping system are open. If the deluge valve opens due to a signal, the entire area will be sprayed with water.

early warning smoke detector

A passive detector that uses ionization and photoelectric sensors.

heat detector

A unit that sends a response when the convection of thermal energy changes the temperature of the device’s heat-sensitive element.

suppression control panel

The unit that houses the interface you use to control the fire protection system.

very early warning smoke detector

A smoke detector that samples air particles via aspiration to find non-visible smoke.

BUYING TIPS:

Cable & Airflow Management



MANAGING CABLES is an afterthought. That’s an unfortunate reality among many data centers, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Among other things, poor cable management leads to performance problems and issues with troubleshooting and airflow.

✓ **Know What’s Available**

Brett Femrite, sales manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says well-designed patch cable storage managers, which house and cover patch cords between patch panels and devices, are popular. He says they are not only functional in helping reduce cable sprawl, but they are also bend-radius-compliant and offer cosmetic appeal. Other cable management options include horizontal and vertical wire managers (which can be mounted on the front or rear of your equipment rack or cabinet), cable ladders, a large assortment of cable trays and conduits, and various wire minders (rings) that can be mounted on any rack system.

Vertical and horizontal lacer bars are also very popular, Femrite says. “These bars can be mounted on a rack or within a cabinet and have slots through which Velcro enclosures or cable wraps are routed to hold groups of cable,” he says.

Carrie Higbie, global director of data center solutions and services at Siemon (860/945-4200; www.siemon.com), says larger and wider cabinets, such as the 48-inch deep cabinets many companies are purchasing today, can allow for vertical patching or even just more room for power and communications cabling. Baffles for side discharge equipment are an important part of managing airflow.

✓ **Plan For Expansion**

Laura Viars, senior sourcing specialist at Rackmount Solutions, says to be sure your cable management configuration allows for future equipment additions. Do this by making certain managers (both in-rack cable managers and external trays and ladders or conduits) don’t meet or exceed their fill capacities. Most management options are available in multiple sizes, she says, ensuring a fit with plenty of excess if needed.

Also seek solutions with the flexibility to add new equipment or troubleshoot an existing component. “Lean toward reusable options such as Velcro straps in lieu of cable ties and managers that allow easy access to their contents,” she says. If you expect rapid and near-term growth, keep cables loosely organized during implementation by

cutting down on the bundling and by using managers (D-rings vs. managers with covers) offering easier access.


✓ **Avoid The Swing Arm**

Server-mounted swing arms are a common solution for cable management, Higbie says, but they actually cause problems with airflow and cooling. “Swing arms route cable horizontally across the equipment, blocking exhaust fans and spaces critical to proper hot aisle/cold aisle airflow,” she says.

You can eliminate server swing-arm doors by routing cords and cable directly into zero-U vertical patch panels or cable management channels, Higbie says, which dramatically reduce the airflow disruption in the horizontal cabinet space seen in

traditional cabinets with swing-arm doors. “Plus, you get greater cable capacity, simpler cable management, and a much better looking installation.”

✓ **Consider Color & Labeling**

Koty says when possible, use color coding to help visually identify and trace cables and simplify management. With data cables, use color to identify the cable’s role/function or connection type. With power cables, use color to identify and organize dual-power feeds for redundant power sources. Secure labels so they’re accessible but difficult to remove. Also, maintain a spreadsheet that identifies the cables and colors, where cables come from and go, and configurations. 

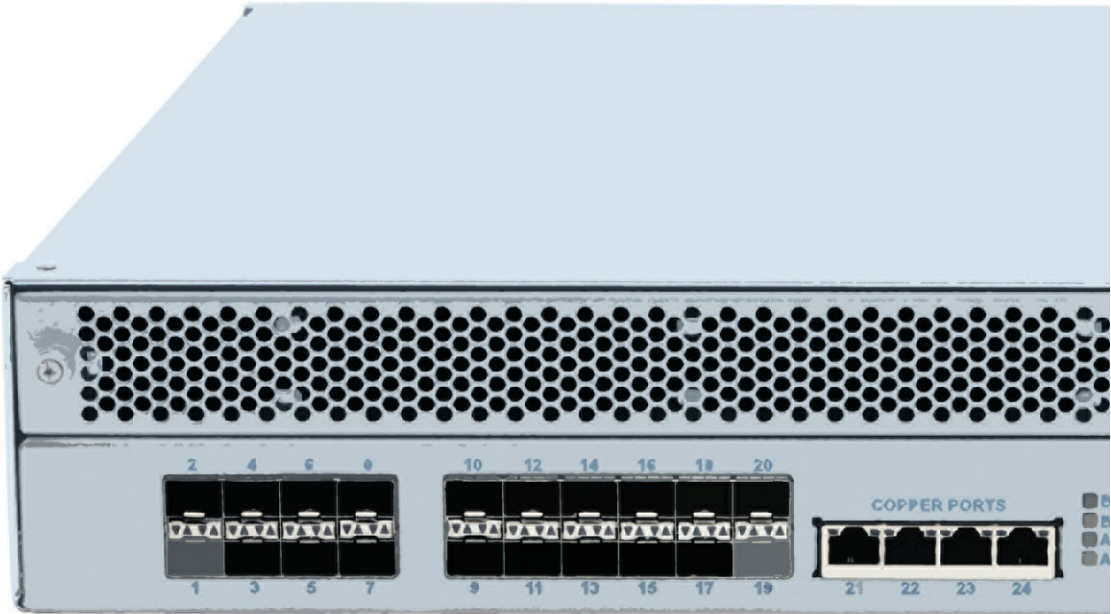
BUYERS’ CHECKLIST

- ✓ **Make sure you have room.** Mark Weinegger, vice president of sales at CE Communication (866/966-1555; www.cecommunication.com), says to make sure you have enough room in your rack elevation layout to support the cable management devices purchased. Zero-U devices take up virtually no space in the rack while still allowing easy identification of the cable coming off a switch.
- ✓ **The basics.** Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says no matter the size of installation planned, you’ll likely need basic management items such as vertical managers to bundle cable along the height of the racks/cabinets; horizontal managers to bring the cabling neatly from the drop to the equipment; and Velcro straps to bundle cables as needed.
- ✓ **Testing.** Pre-test all cable before installing, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Once installed, it’s more difficult to test and identify problems.

KEY TERMS

- cable bend radius**
The minimum radius a cable can acceptably bend and still function as intended.
- TIA/EIA**
The Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) provide best practice guidelines regarding cabling infrastructure.

BUYING TIPS:



Networking Equipment

THE HEALTH of a company’s network is crucial to its productivity. As such, the decision about what equipment runs your enterprise network can’t be taken lightly. As you evaluate which equipment you’ll buy to run your network and improve metrics overall, here’s what to watch for.

✓ *Seek Advice*

Before buying next-generation network gear, build your knowledge of current standards, protocols, and vendors’ proprietary features. Doing so, says Rob Enderle, principal analyst for Enderle Group, can save time in narrowing down vendors and what equipment is available that can meet specific needs. “Like a fine wine, you don’t implement a standard before it’s time, but you don’t want to be excessively late, either,” Enderle says. “Otherwise, you’ll likely pay a premium for aging technology. Stay informed.”

✓ *Find The Right Equipment*

When it comes to buying the right equipment, Matthew Butrimovitz, marketing manager at Interface Masters Technologies (408/441-9341; www.interfacemasters.com), says to consult manufacturers. “The best way to find out what you need is to call a sales rep from the company. Give them an idea of what your network looks like, and they can work with you to find the right solution.” Butrimovitz cautions against buying strictly based on brand name. “Just because a company is a leader in the market doesn’t mean it necessarily has the best solution for you,” he says.

✓ *Look For Cost-Effective Upgrades*

It’s important to look for ways to cost-effectively upgrade networking equipment. To start with, Butrimovitz says to find a solution that fits your needs. “You can go out and purchase a 48-port switch, but you might really just need a 24-port switch. Make sure you spend your money wisely.” Eric Hanselman, research director, networks at 451 Research, says before upgrading, you need to assess the performance of the various components of the network. Surveying network performance can pinpoint whether core, edge, or access need attention. Wireless performance can be more complex to assess, Hanselman says. Because the radio frequency performance varies with physical building constraints and the wireless devices involved, you may need expert help. “Simply adding more access points can often make a bad situation worse,” he says.

✓ *Go To The Core*

Core network upgrades can add capacity that elements at the network edge can leverage, Hanselman says. “This is a good investment if there is congestion in the core, and this is often the case,” he says. “If access performance is a bottleneck, either for devices or for traffic headed to the Internet or wide area network, a core upgrade won’t make a noticeable difference.” One possibility for cutting costs when upgrading core networking gear is acquiring used or refurbished components. Hanselman says such gear can offer reasonable value, “as long as it’s still actively supported by the manufacturer.” Support, he says, must include the firmware and OS. “For some manufacturers, equipment components can be upgraded without replacing a whole chassis,” he says. “Control or supervisory module upgrades may be available in both new and refurbished equipment.”

✓ *Bargain For Better Prices*

Vendors are often willing to get aggressive with pricing, especially if they know competitors are in the picture. Pin down your list to two or three vendors that you’ll be happy with and then start bargaining. Where the ideal time to buy is concerned, Enderle says it’s helpful to have someone you trust who is active in the standards efforts in on the decision “so they can tell you of the pitfalls and help you with timing,” he says. “This ensures you neither buy early nor late.”

✓ *Take Your Time*

Spending the time to implement a network refresh correctly can result in time and money savings later. “Much of the cost connected to any technology change is the result of mistakes that result in the firm buying what they don’t yet and may never need and in undoing bad decisions,” Enderle says.

BUYERS’ CHECKLIST

- ✓ Is the product designed for the needs of your particular enterprise?
- ✓ Is purchasing used equipment an option?
- ✓ Are you up to date with current standards and protocols?
- ✓ Is this upgrade something you will take advantage of now or in the near future?

KEY TERMS

- bypass switch**
Provides a fail-safe access port for inline networking appliances, automatically routing traffic around the appliance when it experiences a failure.
- Gigabit Ethernet (GbE)**
Technology for transferring information at the rate of 1 billion bits per second. Other high-speed standards include 10GbE, 40GbE, and 100GbE.
- IPv6**
A communications protocol designed to replace IPv4 and prevent the problem of running out of potential IP addresses. IPv6 uses 128-bit addressing, compared to IPv4, which uses 32-bit addressing.

BUYING TIPS:

Security



WITH SO MANY SECURITY solutions on the market, it can be difficult to choose the right ones. Here is some advice on what every enterprise needs.

✓ Start With Network Access Control

A network access control solution will limit unnecessary access to your company’s internal resources. If you can prevent outsiders from connecting to your network, then there is a much smaller chance of a security breach. Network access control systems can also be used to monitor the mobile device connections of employees working outside the company. Smartphones and tablets are becoming popular targets for hackers, so checking to make sure the external connection is safe and secure will go a long way toward preventing a potential intrusion.

✓ Move Up To Unified Threat Management

A UTM solution goes a bit beyond network access control by essentially creating a gateway through which all users and data have to pass before landing on your company’s internal infrastructure. UTM combines intrusion prevention, antivirus, antispam, and many other features into one solution designed to protect your company.

✓ Don’t Forget Email Security

Receiving malware-filled messages can result in the infection of one computer or the infrastructure of the entire company. And sending messages with sensitive information no matter what the reason is always a dangerous proposition. As one of the most basic measures, every company should have some form of encryption attached to its email systems. Encryption helps ensure that even if an email is intercepted, it is less likely that a hacker will be able to mine anything from it.

Along with encryption, you’ll want to invest in an antivirus program to protect servers and endpoints against malicious code and viruses. Make sure the program you purchase automatically downloads and deploys signature files all the way to the endpoints.

✓ Add In Data Loss Protection

An enterprise data loss prevention (DLP) solution can “offer a lot of capability in terms of preventing the egress of data,” says James Quin, lead analyst at Info-Tech Research Group. Such solutions can be expensive, so finding existing tools with DLP capabilities (up-to-date network perimeter UTMs and comprehensive endpoint anti-malware packages) can “deliver

at least a moderate level of protection without the excessive cost,” he says.

✓ Check For Updates & Upgrades

Making certain basic security tools are in place is half the battle. The other half is ensuring antivirus systems, hardware, and anything else tied to security are continually patched and updated.

Dan Olds, founder of Gabriel Consulting Group, says IT should take a “maniacal” approach toward patching software and firmware. “Unpatched and unmaintained systems are the biggest cause of security vulnerabilities,” he says. “The biggest trouble areas are

systems on the network that haven’t been maintained and patched to the appropriate levels. There are a wide range of devices that tend to fly under the radar, including servers, desktops/laptops, and networking components. If something is on the network and can see the outside world, it can end up being a vulnerable point that can be exploited.”

One possibility, Olds says, is using a network discovery tool that tracks down everything on the network and creates an inventory of items that need to be checked and that need the latest patches. “This is a good project for a new hire or intern—provided they’re supervised,” he says.

BUYERS’ CHECKLIST

- ✓ Does the solution allow you to limit access to the network and block unwanted connections?
- ✓ Can the solution provide a perimeter defense that prevents threats from landing on your servers and other internal equipment?
- ✓ Email makes it easy to infect computers with viruses and send out sensitive data to hackers, so you should invest in a strong email encryption solution.
- ✓ Will the vendor help you set up an update and upgrade plan that will let you keep your security solutions up to date without breaking your budget?

KEY TERMS

mail transfer agent (MTA)

A solution that catches and checks incoming email for threats before transferring it to your internal email platform.

network access control

A solution that helps you limit access to your network and lower the chance of an infiltration.

unified threat management (UTM)

Software (often installed on a managed appliance) that seeks to comprehensively block malware and network threats through features such as a firewall, antivirus, antispam, intrusion prevention, VPN, access policy enforcement, and more.

BUYING TIPS:

Get Rid Of Used Equipment

GETTING RID OF USED EQUIPMENT is one of those tasks that tends to get put on the back burner. It can be expensive and messy and take time away from other more important projects. These tips can simplify the process and help you find a recycling or disposal service partner you can trust.

✓ *Establish A Plan*

From an IT perspective, dealing with outdated equipment should be part of an overall disposition plan you do within a hardware asset-management program, says Darin Stahl, lead research analyst at Info-Tech Research Group. Knowing what to do with outdated equipment should “just be an outcome of your end-to-end hardware asset-management program, and just one of the disposition options. Plug it into the back end of that process and don’t make it a one-time event,” he says.

✓ *Know Your Options*

One of the most common methods for getting rid of used equipment is a fire sale, but many data centers will need to be aware of who they are selling to.

“A less time-consuming method is to sell to one of the many companies that exist by buying used servers and equipment and refurbishing them,” says Brett Femrite, director of business development for Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). “Often you will receive pennies on the dollar for this equipment, but normally the buyer will pay to pick it up and ship it to their facility and get it off your hands.”

Another option is an asset recovery program, which is a service that performs both the IT asset buyback as well as the physical recycling of hardware. Some vendors will even create a fund for your organization so that the money you gain from selling used hardware can be used to purchase recertified equipment when you need new hardware.

✓ *Complete A Thorough Audit To Find Equipment You No Longer Need*

“You should identify and know what equipment you have on hand, what’s

operational, and what’s been abandoned or is under- or unused,” Femrite says. “You can’t do much to get rid of unused equipment until you have completed a thorough audit and identified what can be removed.” The inventory auditing process can be both tedious and time-consuming, as you’ll want to check out all equipment, including fans, shelves, cables, and wires.


✓ *Know What You Need From A Recycling Or Disposal Service*

Which equipment recycling or disposal service you choose depends on your goals, including security and environmental concerns and whether this is a one-time disposal or something that’s ongoing.

For example, a company where data security is mission-critical will want to go with a service that keeps detailed records of wiping, reset, degaussing, and destruction of equipment. Many hardware resellers and disposal services will provide a complete report down to the final destination of the equipment, whether it be a certificate of destruction or information

about recycling activity, such as if it was dismantled into parts for other products. Some hardware disposal companies are even audited to ensure compliance. If you want to continually recycle or resell surplus hardware, you may want to look for a service that will set up an ongoing contract with you.

When seeking an asset disposal service, “Look to work with companies with a reputable asset recovery or refurbishing program,” Femrite says. “They can often provide help in determining the value and final disposition of your unused IT assets and offer a variety of options to suit your needs.”

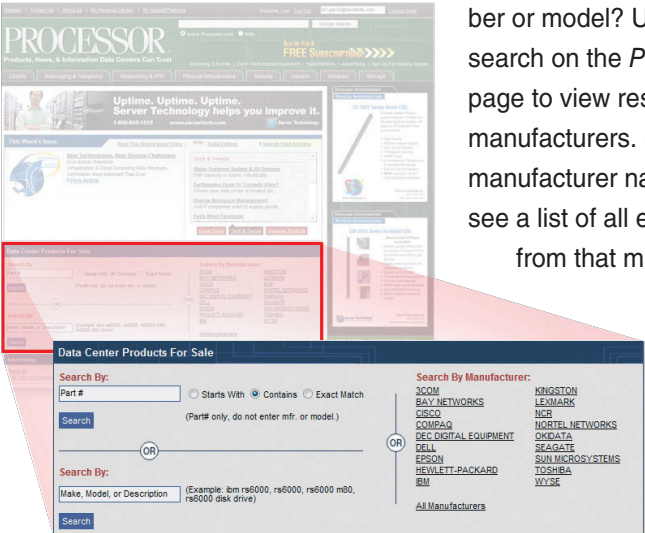
For example, a disposal service company may be able to tell you if it’d make more economic sense to repair or reconfigure a given product, rather than destroy it or tear it apart for recycling. By maximizing the value of your equipment, an asset recovery service can also help to improve the green status of the company, because you are helping to make hardware sustainable for a longer period of time. 

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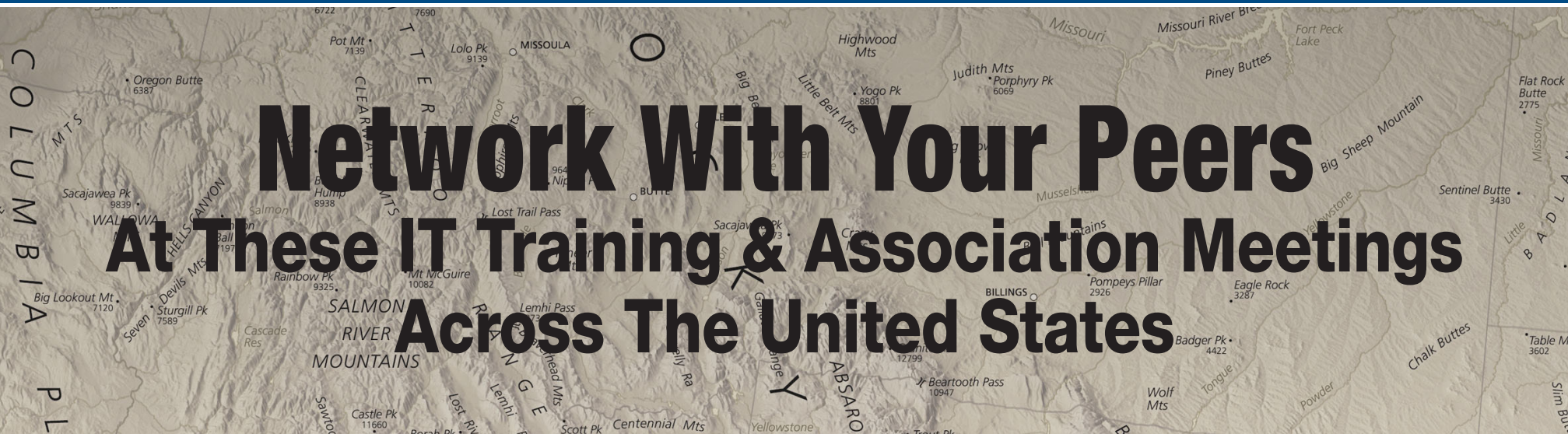
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Upland, Calif.
ie.issa.org

ISSA Baltimore

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www.issa-balt.org

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AITP Richmond

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Hilton Garden Inn at Innsbrook
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Glen Allen, Va.
www.aitprich.org

AITP Wheeling

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White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
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AFCOM Potomac

Sept. 12
Augustine Golf Club
76 Monument Drive
Stafford, Va.
www.afcom.com

AITP
Washington, D.C.

Sept. 12
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

BICSI
Fall Conference

Sept. 15-19
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3799 Las Vegas Blvd.
Las Vegas, Nev.
www.bicsi.org

CompTIA
Network Certification

Sept. 16
New Horizons Lexington
1050 Chinoe Road, Suite 208
Lexington, Ky.
www.nhlexington.com

AFCOM Greater
Tampa Bay Chapter

Sept. 18, 12:30 to 4 p.m.
www.tampabayafcom.com

AITP
Northeastern Wisconsin

Sept. 18
Holiday Inn Appleton
105 S. Nicolet Road
Appleton, Wis.
new.aitp.org/eventsmeeting-info

AITP Twin City

Sept. 19, 7 p.m.
Ozark House Restaurant; 704 McGregor St.
Bloomington, Ill.
www.aitp.org/members/group_content_view
.asp?group=75779&id=125369

Cisco CCNP Security
Certification Training Course

Sept. 21
Institute of Professional Learning
500 W. Cypress Creek Road
Ft. Lauderdale, Fla.
www.iplearning.net

AITP Akron

Sept. 24
Akron, Ohio
www.akron-aitp.org

ISSA Inland Empire

Sept. 24, 6:30 to 8:30 p.m.
Upland, Calif.
ie.issa.org

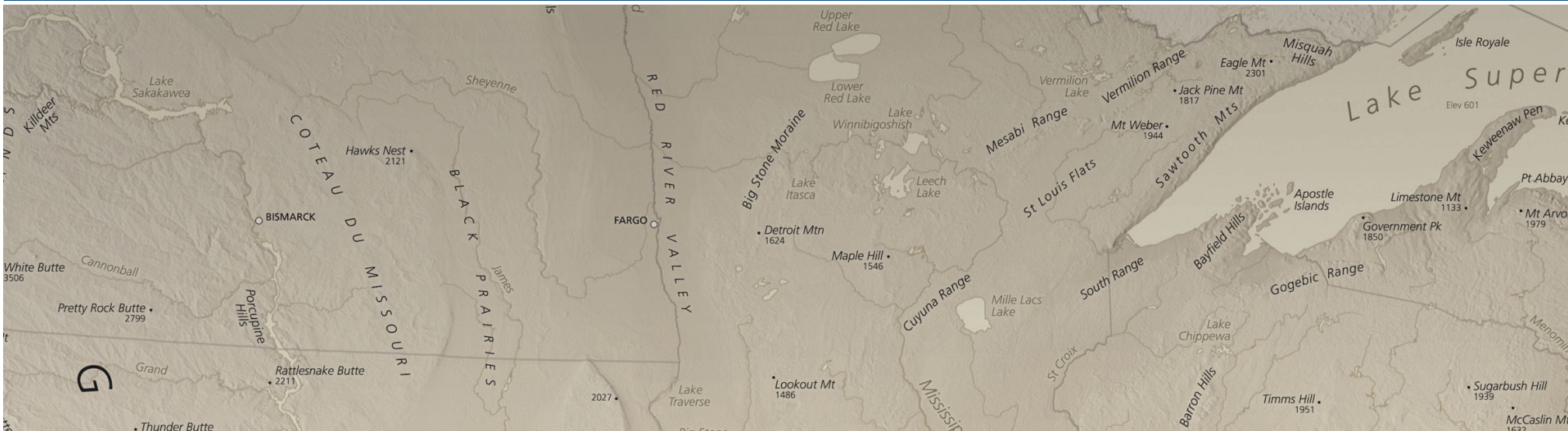
AITP California Southland

Sept. 25
Garden Grove, Calif.
www.aitpcalsouthland.org

ISSA Baltimore

Sept. 25
Concurrent Technologies Corp.
8530 Corridor Road
Savage, Md.
www.issa-balt.org

Upcoming IT Events



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Sept. 29-Oct. 2
Orlando World Center Marriott
Orlando, Fla.
www.datacenterworld.com

Deploying Windows Server 2008

Sept. 30
New Horizons Tysons Corner
2010 Corporate Ridge, Suite 200
McLean, Va.
www.dcnewhorizons.com

Interop

Sept. 30-Oct. 4
Javits Center
New York, N.Y.
www.interop.com

OCTOBER

AITP Wheeling

Oct. 9
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Fall Region 5 Conference

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The Chateau
1601 Jumer Drive
Bloomington, Ill.
www.aitp.org/group/905

AITP Region 5 Leadership Workshop

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www.aitprich.org

AITP Southwest Missouri

Oct. 15
High Street Baptist Church
900 N. Eastgate Ave.
Springfield, Mo.
aitpspringfield.org/main.html

AITP Northeastern Wisconsin

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Holiday Inn Appleton
105 S. Nicolet Road
Appleton, Wis.
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www.issa-balt.org

AITP Region 18 IT CON

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340 Racetrack Road
Washington, Pa.
www.aitp-region18.org

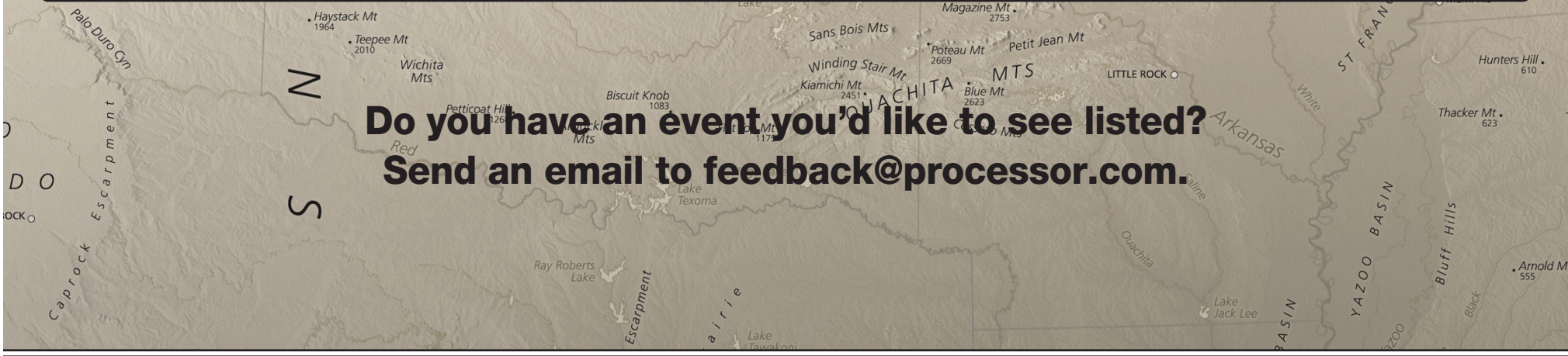
AITP Akron

Oct. 29
Akron, Ohio
www.akron-aitp.org

ISSA Inland Empire

Oct. 29, 11:30 a.m. to 1:30 p.m.
Upland, Calif.
ie.issa.org

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Environmental monitoring isn't new to IT and data center managers. In fact, most companies have purchased at least one, if not multiple solutions designed to warn you if the temperature or other conditions inside a rack are nearing a specified threshold. But these solutions vary widely in terms of price, size, and features, which can make it difficult to make changes to your overall system or come up to the latest on environmental monitoring technology.

But it's more important than ever to extend the life of equipment, ensure efficiency, and prevent unnecessary damage to servers and other equipment through the use of environmental monitoring devices.

AVTECH has been working diligently over the past 25 years to not only make improvements to its own products but help serve the entire industry forward and on new standards. With the Room Alert 3E, AVTECH has packed 10 years of experience and technological know-how into a smaller and more affordable solution that's full of new features designed to maximize downtime and give you a heads up before a small issue becomes a potentially larger problem.

Small Footprint & Price

With a footprint of about six square inches and a weight of two ounces, the AVTECH Room Alert 3E takes up much less physical space than most other environmental monitoring solutions. And it does so without skimping on critical features. With such a small footprint, you can focus on when environmental monitoring is needed the most and quickly and easily implement a Room Alert 3E.

AVTECH

AVTECH says the 3E's \$145 price tag will quickly pay for itself in downtime prevention. "When considering the total cost of IT equipment at an organization, the labor expense to replace equipment when it gets damaged, and the cost per minute of downtime for an organization, Room Alert 3E will be as valuable to an IT manager as an extra 15 minutes of uptime in a web server," says Michael Signorini, senior product specialist at AVTECH. "When things go bad, it's a life-saver."

The device has a built-in temperature sensor and a digital port for connecting an additional digital sensor for other environmental factors or a light tower and relay adapter, which can be shared by all Room Alert monitors across a network, Signorini says. For power, you can take advantage of the built-in PWR capabilities or add an optional AVTECH 5V 1A power adapter for \$15.

As with most other AVTECH environmental monitoring devices, the Room Alert 3E comes with AVTECH's powerful Device Manager software. The software is used as an alternative to the built-in Web browser interface or a generic SNMP monitoring application, providing advanced discovery, management, alerting, logging, graphing, a dashboard interface, and more, Signorini says.

With the Room Alert 3E, you can receive alerts via email, email-to-SMS, SNMP, Web page updates, and more. Plus, Device Manager takes advantage of AVTECH's new PUSH technology, which lets you configure Room Alert monitors to send event data outboard from within a secured network to Device Manager on a different network for alerting and data storage. This allows organizations to monitor across multiple networks securely, without shared network access. Device Manager also lets you combine network cameras with Room Alert devices and see unlimited camera views in a single screen, snapshots and video links in alerts, says Signorini.

Flexibility & Support

The Room Alert 3E is flexible both in terms of size and features-out. You can choose to purchase one device for a single use, implement one or more devices into an existing system, or build an entirely new environmental monitoring infrastructure complete with in-depth management software. AVTECH backs up its products with world-class customer support, which is free of charge for the first year and can be renewed on annual basis for a small fee.

"AVTECH's Maintenance, Support & Update Service (MSUS) program provides our customers with unlimited technical support, download access for firmware-software-MIBs, which typically include two to four updates a year, and provides our 100% replacement guarantee for the Room Alert monitor," Signorini says.

In many cases, Signorini says, the cost of an MSUS plan comes down to pennies a day and even less per unit if they purchase multiple Room Alert 3E devices. It's just another sign of AVTECH's commitment to its customers, which now number more than 150,000 in 150 countries. "We're proud of our MSUS program and appreciate every single customer we've had the privilege to earn," he says.

Contact:
(800) 334-7458
www.avtech.com

PROCESSOR

For more information, call (800) 334-7458 or go to www.processor.com.

Processor Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

PHYSICAL INFRASTRUCTURE



Cablesys, headquartered in La Mirada, California, is a leading manufacturer of high performance fiber cables, fiber jumpers, CAT 6 patch cords, CAT 5e patch cords, CAT 6 cables and connectivity solutions. We have millions in stock that can be shipped same day and best of all, 20% less than name brands.

Products Sold:

- Fiber Optic Cables
- Fiber Patch Cords
- Networking Patch Cords
- Telephone Line Cords
- Audio and Video Cables
- Mini Coax Cables

Custom Cable Assemblies:

- Pre-bundled Cable Assemblies
- Trunk Cable Assemblies
- Multi-strand Cable Assemblies
- Pre-labeled and Pre-kitting
- OEM Cable Assemblies

(800) 555-7176 | Cablesys.com/pro

PHYSICAL INFRASTRUCTURE



Atlas has specialized in portable air conditioning since 1979 and leads the industry in server room and data center portable cooling. We offer “24/7” response from company-owned, full-service offices around the country, each stocked with a wide inventory of equipment for primary, supplemental, or emergency cooling. All portable items are available for sale or rental. Atlas is a Preferred MovinCool® Distributor and a GSA Certified MAS Contractor.

Products Sold:

- 1-5 ton portable air conditioners, air and water-cooled
- 12-ton portable coolers designed to roll through a standard doorway
- Ceiling-mount air conditioners – full line of MovinCool® packaged a/c units

(800) 972-6600 | www.AtlasSales.com

PHYSICAL INFRASTRUCTURE



AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS

(888) 220-6700 | www.AVTECH.com

PHYSICAL INFRASTRUCTURE



Geist is a leading data center provider for power strips, monitoring equipment, cabinet containment & in-rack cooling, and DCIM systems. Geist’s power strips are tailored to meet each client’s needs and provide unbeatable performance in the data center. Our industry leading monitoring and cooling solutions increase data center efficiencies and make going green easier than ever before.

Products Sold:

- Power
- Cool
- Monitor
- Manage

(800) 432-3219 | www.geistglobal.com

PHYSICAL INFRASTRUCTURE



BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- Power control, distribution, management, and metering
- Power transfer switches
- Console management and remote site management

(800) 523-2702 | www.baytech.net

PHYSICAL INFRASTRUCTURE



Founded in 1985, Raritan has become a leading provider of power and energy management, DCIM and KVM solutions. Our products are in use at more than 50,000 locations worldwide, including eBay, Cisco, Intel, NASA, and the United States Post Office, giving IT departments the tools they need to increase power management efficiency, better manage data center changes, improve data center productivity and enhance branch office operations.

Products Sold:

- Intelligent Rack Power Distribution Units
- Energy Management Software
- Data Center Infrastructure Management
- KVM and Remote Access Management

(732) 764-8886 | www.raritan.com

PHYSICAL INFRASTRUCTURE



As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employee-owned, focusing on quality people and exceptional products.

Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- Connectors and cables (cord sets, ePDU cables)
- Cooling (air flow management, portable cooling)
- Racks and enclosures (standard racks, battery racks)
- Safety equipment (spill containment, safety signs)

(800) 672-7244 | www.hmcragg.com

PHYSICAL INFRASTRUCTURE



Server Technology is committed to the PDU market with the largest group of engineers dedicated to power distribution and other solutions within the equipment cabinet. Advancements in device power monitoring help data centers monitor and improve their efficiency, and continuous research and development is fueled by companies that look to Server Technology for their custom cabinet power solutions.

Products Sold:

A complete line of cabinet PDUs, including Per Outlet Power Sensing (POPS), Rack Mount Fail-Safe Transfer Switch, Console Port access with remote power management, Switched, Smart, Metered, Basic, and -48 VDC

(800) 835-1515 | www.servertech.com

PHYSICAL INFRASTRUCTURE



LINDY USA specializes in cables, adapters, electronics and accessories for computer, networking and audio video applications. Since 1932 Lindy has supplied high quality interconnects to customers in commercial, telecom and residential markets. What sets us apart is our complete dedication to innovation, performance and reliability. Our cabling products are truly outstanding.

Products Sold:

- Networking Products • Audio / Video • KVM • Sharing, Converting, Extending • USB and FireWire • Input Devices • Add-On Cards • Hardware and Security • Power • Cabless • Adapters and much more!

(888)-865-4639 | www.lindy-usa.com/

PHYSICAL INFRASTRUCTURE



Headquartered in Connecticut, Siemon has been around since 1903 as a provider of high-quality cabling solutions designed to improve network connections, performance, and efficiency. The company manufactures end-to-end copper and fiber cabling systems, cabinets, racks and cable management solutions for data centers, and more. Siemon also has an R&D arm, Siemon Labs, which focuses heavily on innovation and shows the company’s long-term commitment to its customers.

Products Sold:

- Cable management solutions
- Data center cabinets and racks
- End-to-end copper and fiber cabling
- High-speed interconnects
- Intelligent infrastructure management

(860) 945-4200 | www.siemon.com

PHYSICAL INFRASTRUCTURE



PDUsDirect.com is a Master Distributor of select Server Technology PDUs for server and networked environments. PDUs Direct’s basic, metered, and switched Rack PDUs provide local and remote power management, power monitoring, and environmental monitoring. We pride ourselves in offering industrial-grade quality products at the lowest prices, with the fastest shipping (most orders shipped within 24 hours) and simplest purchase process. We are the Power Behind the Business.

Products Sold:

A complete line of metered and basic PDUs, and 20A switched PDUs.

(888) 751-7387 | pdusdirect.com

PHYSICAL INFRASTRUCTURE




RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

Products Sold:

Computer server racks, cabinets, shelves, and mounting products.

(888) 903-7225 | www.racksolutions.com

PHYSICAL INFRASTRUCTURE



Founded in 1995, Austin Hughes Electronics Ltd is a design and manufacturing group that offers a broad range of solutions based around 19 inch rack mount technology. With a wealth of experience Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handels
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 | www.Austin-Hughes.com

PHYSICAL INFRASTRUCTURE



Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

Products Sold:

- Racks
- Enclosures/cabinets
- Motorized workstations
- Flat-panel arms
- Computer desks
- Cable management
- Power management

(888) 222-7270 | www.hergo.com

PHYSICAL INFRASTRUCTURE




Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

Products Sold:

- Cleanrooms
- Strip doors
- Enclosures
- Curtains

(877) 746-7540 | www.simplexisolationssystems.com

PHYSICAL INFRASTRUCTURE




PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | www.pducables.com

PHYSICAL INFRASTRUCTURE



Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, high-performance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

Products Sold:

- Wallmount and server racks and cabinets, including sound proof, air conditioned, and large cable bundle
- Desktop/tabletop portable racks
- Shockmount shipping cases
- Bulk cable

(866) 207-6631 | www.rackmountsolutions.net

PHYSICAL INFRASTRUCTURE



AmeriCool, Inc. is the official sales, marketing, and distribution company for Weltem Air Conditioning products in North America. Our AmeriCool portable air conditioners are built to the highest standards in the industry and offer unbeatable performance, reliability and value. With products ranging from 1 to 5 tons we offer air conditioning solutions to companies small and large. Due to the wide operating range of our product, 24/7 cooling capability and rugged design, our product is a great solution for mission critical needs and harsh industrial applications.

Products Sold:

- Portable Air Conditioning Units

(800) 680-0725 | www.americoolinc.com

PHYSICAL INFRASTRUCTURE




C.E. Communication Services (CE COMM) distributes, markets, designs, and manufactures Data Center products, specializing in Network Infrastructure, Cable and Wire Management, and Fiber and Copper Cabling.

Products Sold:

- Patented Cable Management Systems for CISCO Catalyst and all 1U Switches
- Standard & Custom Data Center Cable Assemblies: Copper CAT5E, CAT6 & 6A
- High Density Optical Fiber Assemblies
- Fiber Connectivity, Fiber Test - Inspection and Media Conversion Equipment

(866) 966-1555 | www.cecommunication.com

PHYSICAL INFRASTRUCTURE



Corning Cable Systems is a leading manufacturer of fiber optic communications solutions for voice, data and video network applications worldwide. We offer the broadest range of end-to-end connectivity solutions for customers' telecommunications networks. We put companies at the forefront of network innovation, pioneering many of the global products and solutions commonly used in state-of-the-art cabling systems.

Products Sold:

- Cabling

(607) 974-9000 | www.corning.com

PHYSICAL INFRASTRUCTURE



Data Aire, Inc. has been designing and manufacturing precision cooling equipment for more than 40 years. We established some of today's industry standards, such as scroll compressors, steam generator humidifiers and microprocessor controllers. Our equipment can be found in any size organization or data center, from a closet to a Fortune 500 financial data center or government high security operation center. With our experience and expertise we can, and are willing, to design and build equipment to meet our customer's needs. With the shortest delivery times in the industry Data Aire can meet your requirements.

Products Available:

- Floor Mounted Units – CRAC or CRAH
- Ceiling Mounted Units
- Rack and Row Solutions
- Specialty Units
- Heat Exchangers
- System Controls

(800) 347-2473 | www.dataaire.com

PHYSICAL INFRASTRUCTURE




Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Penn.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | www.sensaphone.com

NETWORKING & VPN



Interface Masters Technologies is a leading vendor in network monitoring and high-speed networking. Based in the heart of the Silicon Valley, Interface Masters' expertise is in Gigabit, 10 Gigabit, and 40 Gigabit Ethernet network access and network connectivity solutions that integrate with monitoring systems, inline networking appliances, IPS, UTM, load balancing, WAN acceleration, and other mission-critical IT and security appliances.

Products Sold:

- Hardware load balancers
- Specialized 10GbE internal server adapter cards
- Bypass and failover systems

(408) 441-9341 | www.interfacemasters.com

NETWORKING & VPN



Metric Systems Corporation® designs and manufactures broadband wireless networking equipment, and end-to-end solutions for government and industry. We've been in the business of manufacturing and integrating reliable industrial-grade wireless networking systems for over 25 years. Our networks are deployed around the world protecting and supporting people and machines. Our specialty is working with your unique requirements and existing infrastructure to provide a networking solution that fits your requirements, schedule, and budget.

Products Sold:

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(800) 549-7421 | www.metricsystems.com

SERVERS




Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- Network switches
- GPU servers
- Motherboards
- Storage solutions
- Embedded
- Chassis
- Blade servers

(408) 503-8000 | www.supermicro.com

SERVERS




Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

Products Sold:

- A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 947-3200 | www.chenbro.com

SERVERS




ServerMonkey stocks and delivers new and refurbished servers and networking equipment. Our blend of low prices, high quality and exceptional service offers a unique opportunity for corporate IT groups to economize without compromising.

Products Sold:

- Dell, HP, and other Servers
- Workstations
- Storage
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CLIENTS



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SERVICES



FMI Recycling has been a leader in environmental responsibility for more than 28 years. They specialize in recycling end-of-life products, electronic equipment, scrap metals, and all types of industrial equipment. They pride themselves on their tradition of excellent customer service, knowledge and expertise, logistics capabilities, and community involvement and support.

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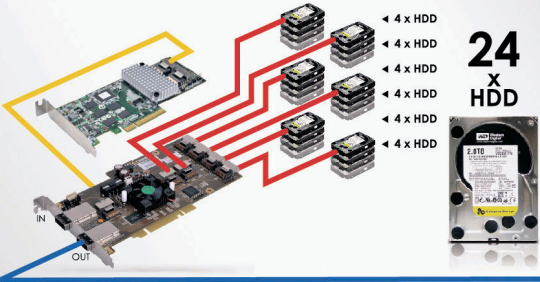
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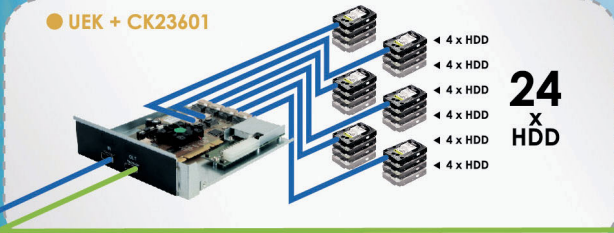
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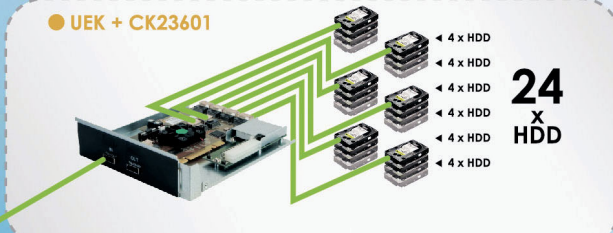
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JBOD1

● UEK + CK23601



JBOD2

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